

**U.S. ARMY MATERIEL COMMAND
PAMPHLET 11-3**

**VALUE ENGINEERING PROGRAM
MANAGEMENT GUIDE**

MARCH 1997

**PREPARED BY: THE U.S. ARMY INDUSTRIAL
ENGINEERING ACTIVITY**



TABLE OF CONTENTS

	PAGE
PREFACE	
Chapter 1 INTRODUCTION TO VALUE ENGINEERING	
1.1 History	1
1.2 Definition and Description	1
1.3 Program Objectives/VE Program	2
1.4 VE Opportunities and Benefits	3
1.5 VE in Government Contracts	4
1.6 VE Terminology	4
1.7 Summary	5
Chapter 2 VE APPLICATION	
2.1 Introduction	6
2.2 Identifying Best Value	6
2.3 Early vs Later VE	6
2.4 Project Selection	8
2.5 VE in Product Development	9
2.6 Summary	13
Chapter 3 OVERVIEW OF VE FUNDAMENTALS AND TECHNIQUES	
3.1 Introduction	14
3.2 The VE Job Plan	14
3.3 Orientation Phase	15
3.4 Information Phase	15
3.5 Speculation (Creative) Phase	17
3.6 Analysis Phase	20
3.7 Development Phase	21
3.8 Presentation Phase	26
3.9 Implementation Phase	29
3.10 Follow-Up Phase	29
3.11 Summary	30

TABLE OF CONTENTS

		PAGE
Chapter 4	FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST)	
4.1	What is FAST and What Makes It Unique	32
4.2	Applications, Management and FAST Team Formation.....	32
4.3	Function Analysis	33
4.4	Defining the Scope of the FAST Model.....	38
4.5	Developing a FAST Model.....	39
4.6	Summary	40
4.7	Questions and Answers	40
Chapter 5	HUMAN RELATIONS IN THE VE PROGRAM	
5.1	Importance of Human Relations in the VE Program	43
5.2	Principles of Social Behavior	43
5.3	Overcoming Roadblocks.....	44
5.4	Promote Cooperation	45
5.5	Summary.....	45
Chapter 6	CONTRACTUAL ASPECTS OF VE	
6.1	Introduction	47
6.2	Benefits.....	47
6.3	Types of VE Provisions in DoD Contracts	48
6.4	What Is a VECP	50
6.5	Sharing VECP Savings	50
6.6	VECP Preparation	52
6.7	VECP Transmittal Letter Requirements.....	53
6.8	The Preliminary VECP	53
6.9	Government Response	54
6.10	VECP Settlement	54
6.11	Subcontractor VE	56
6.12	VECP Submission Without a Contract Provision	57
6.13	VECP Submission Without a Contract	57
6.14	Contested VE Decisions	57
6.15	Summary	57

TABLE OF CONTENTS

	PAGE
Chapter 7	ESTABLISHMENT, OPERATION AND MANAGEMENT OF THE VE PROGRAM
7.1	AMC VE Strategic Planning 59
7.2	AMC VE Policy 59
7.3	AMC VE Regulations 59
7.4	Processing VE Proposals 64
7.5	Reporting VE Accomplishments 66
7.6	Summary..... 71
Chapter 8	TRAINING
8.1	Introduction 72
8.2	Establishing a VE Training Program..... 72
8.3	Types of VE Training 72
8.4	Summary..... 75
Chapter 9	RELATIONSHIP TO OTHER ACTIVITIES/PROGRAMS
9.1	Introduction 76
9.2	Cost Reduction Programs 76
9.3	Army Ideas for Excellence Program (AIEP) 76
9.4	Standardization..... 77
9.5	Total Quality Management (TQM) 77
9.6	Concurrent Engineering (CE) 77
9.7	Operation and Support, Cost Reduction (OSCR) 77
9.8	Technology Insertion (TI)..... 78
9.9	Summary..... 78
APPENDICES	
A.	Acronyms A-1
B.	VE Staff Assistance Visits..... B-1
C.	Checklist for VECF Transmittal..... C-1
D.	Federal Acquisition Regulation Value Engineering D-1
E.	Contract Pricing Proposal Cover Sheet E-1
F.	VE Awards and Publicity F-1

PREFACE

This Value Engineering Pamphlet is a compilation of Government regulations, pamphlets, directives, guidebooks and other documents in an effort to provide a centralized source of reference to assist the Value Engineering Program Manager in the formation and maintenance of a Value Engineering Program. It was prepared to assist in implementing and obtaining benefits from a Value Engineering Program applied to all aspects of Government operations.

The quickening pace of technological advances and the increasing pressure of budgetary constraints have made it necessary to place more emphasis on economy and efficiency within the Department of Army (DA). Value Engineering can make a significant contribution in these circumstances as a versatile technique that can be applied to virtually every product or service.

Despite its name, which might suggest exclusive concern with engineering, Value Engineering achieves optimum results as a management technique. Since it reduces cost not only in hardware but in support services, processes, procedures and administration as well, Value Engineering affects all organizational functions. Crossing traditional organizational boundaries, it draws on the collective knowledge of all employees. It helps many individuals do a better job. Most important of all, it is oriented primarily toward furthering two top management goals: individual motivation and control of costs.

Value Engineering has been proven many times over in significant savings with no impairment of function. In fact, Value Engineering, when properly applied, frequently enhances the safety, performance, and reliability of items, processes and procedures while eliminating unnecessary costs - costs which do not add any value.

Value Engineering, however, is not an automatic operation. It is a technique that should be practiced by personnel trained in the principles and applications of Value Engineering. Accordingly, this pamphlet is intended to inform and guide all levels of management who have responsibility for or direct relationship with VE and to be a reference source for VE training and practice.

This pamphlet is intended as a comprehensive guide to Value Engineering and should not be interpreted as an official directive. It is intended to provide an understanding of the Army Materiel Command (AMC) Value Engineering Program in order to encourage broad participation and achieve maximum benefits.

CHAPTER 1

INTRODUCTION TO VALUE ENGINEERING

1.1 History

Value Engineering (VE) emerged from the industrial community during World War II when many critical materials were difficult, if not impossible, to obtain. This problem forced many manufacturers to use substitute materials and designs. The General Electric Company, found that many of the substitute materials were providing equal or better performance at less cost and initiated an effort to improve product efficiency by intentionally developing substitute materials.

In 1947, Lawrence D. Miles, a staff engineer for General Electric, began the task of investigating this possibility. He developed a number of ideas and techniques to enable this type of change to be performed intentionally rather than accidentally. In effect, Mr. Miles took an old attitude about the search for value and developed a successful methodology designed to assure value in a product. The concept quickly spread through private industry as the possibilities for large returns from relatively modest investments were recognized. Value Engineering, whether called "value analysis," "value improvement," or any other name, was formally implemented in the Department of Defense (DoD) in 1961. In addition to in-house use of the system, the DoD applied the concept in defense procurement. Contractors who previously had no financial incentive to propose specification or design changes in order to reduce costs, were now not only encouraged to make changes, but were offered an attractive opportunity to share in the savings.

In today's market, VE has proven to be a sound economic venture. Its overall record of performance where it has been intelligently applied, discreetly managed, and honestly reported is impressive. It has reduced manufacturing and procurement costs typically by 15 to 25 percent - including the costs of performing VE itself. VE has consistently produced a Return On Investment (ROI) of anywhere from a ratio of 2:1 to 20:1. The ROI within DoD is typically 10:1.

Over the years, the VE concept has proven so successful that today it is practiced throughout the world with many organizations dedicated to its use and promotion.

1.2 Definition and Description

1.2.1 VE Defined. In the Army, VE is defined as an organized effort directed at analyzing the functions of systems, equipment, installation, operation, maintenance, repair, replacement, facilities, procedures, and supplies to achieve only the necessary function(s) at minimum overall cost without degradation of the system function. It involves an objective appraisal of functions performed by parts, components, products, equipment, procedures, services, etc. - in short, anything that costs money.

VE is not primarily centered on a specific category of the physical sciences, but it incorporates available technologies, as well as the principles of economics and business management, into its procedures. When viewed as a management discipline, it utilizes the total resources available to an organization to achieve broad management objectives. Thus, VE is seen as a systematic and creative approach for enhancing the function to cost of components, weapons systems, facilities, procedures, and materiel acquired and operated by the Army. VE is concerned with acquiring good value by investigating what the product or service does in relation to the money spent on it.

1.2.2 Types of VE Recommendations. There are two terms used for the recommendations resulting from VE efforts:

(1) Value Engineering Proposal (VEP) - A specific proposal developed internally by Army personnel for total value improvement from the use of VE techniques. Since VEPs are developed and implemented by Government personnel, all resulting savings accrue to the Government.

Note: VEPs can also be the result of contractor efforts, when contractors are funded by the Government specifically to conduct a VE study, e.g., technical support contract to conduct a VE study.

(2) Value Engineering Change Proposal (VECP) - A specific cost reduction proposal, developed and submitted by a contractor under VE contract provisions, which requires a change to the contract and saves the Government money. A contractor is awarded a share of the savings realized by the application of a VECP, as determined by the contract clause and type, which is spelled out in the Federal Acquisition Regulation (FAR) and modified by the Defense Federal Acquisition Regulation (DFAR), and the Army Federal Acquisition Regulation (AFAR).

1.3 Program Objectives/VE Program

1.3.1 Program Objectives. The basic VE concept is that "anything which provides less than the performance required by the customer is not acceptable; anything providing more should not result in additional cost". The VE Program objective is to reduce the Government's acquisition and ownership costs (operational costs, maintenance costs, training costs, etc.) while maintaining the necessary level of performance, reliability, safety, quality, and maintainability. This objective may be achieved by promoting the use of VE techniques by Government personnel and by encouraging contractors to respond to the VE clauses in DoD contracts.

Depending on the contract clause, the contractor is invited or required to question the value of government specifications, statements of work, and those requirements that contribute nothing (except cost) to the contract tasks or items being acquired. The Government shares any cost savings resulting from a VECP with the contractor. Both the Government and contractor must work together to capture the actual benefits of VE efforts.

1.3.2 VE Program. A typical VE program includes an organized set of definitive tasks which applies the VE discipline to all major elements of an organization. An effective and sustained VE program will have :

(1) Periodic top management attention to ensure implementation and continuing support by the entire organization.

(2) A key individual to manage the VE program. This individual should be well trained in VE principles, techniques, and contractual aspects. It is recommended that an individual with an engineering background hold this position. Communication, oversight, and involvement in engineering studies are routine activities of successful VE managers.

(3) A "master plan" to ensure that actions which will effectively contribute to a successful VE program are considered and acted upon.

(4) VE objectives, policies, responsibilities, and reporting requirements firmly established and implemented.

Defense industry VE programs will also include :

- (1) Close coordination with Contracts Administration and marketing follow-up.
- (2) A strong VE training and indoctrination program.
- (3) Corporate understanding that the VE discipline can be used to earn additional income.

Although there are many other specific tasks required to assure that VE achieves its full potential, the above form the foundation upon which the structure of a VE program must be built.

1.4 VE Opportunities and Benefits

1.4.1 VE Opportunities. In 1965, the DoD conducted a study to determine the predominant sources of opportunity for VE. The aim of the study was to obtain an indication of range and degree of application. From a sample of 415 successful VE changes, the study identified seven factors which were responsible for about 95 percent of the savings achieved. The seven factors in order of percent of total savings were: advances in technology, excessive cost, the questioning of specifications, additional design effort, changes in user needs, feedback from test/use, and design deficiencies. However, the study revealed that a single factor was rarely the basis for a VE action.

VE uses a fundamental methodology which challenges everything and takes nothing for granted, including the necessity for the existence of a product, process, or procedure. It may be successfully introduced at any point in the life cycle of the subject under consideration. The following lists some of the areas to which VE has been applied within the Army.

- Administrative procedures
- Construction
- Design or equipment modifications
- Equipment and logistics support
- Equipment maintenance
- Facilities, master plans, and concepts
- Hardware
- Installation
- Operation
- Maintenance
- Manufacturing processes
- Material handling and transportation
- Packaging, packing, and preservation
- Procurement and reprocurement
- Publications and manuals
- Quality assurance and reliability
- Salvage, rejected or excess material
- Site preparation and adaptation
- Software
- Testing, test equipment, and procedures
- Tooling

1.4.2 Benefits of VE. Benefits from the VE program are significant. Government savings exceeding \$400 million a year are being reported within AMC. Benefits of this magnitude are noteworthy but do not tell the full story. Equally important is the fact that the dollar savings/assets that are made available through VE successes may be reapplied within the program, command, or component to finance approved but previously unfunded requirements.

For DoD contractors and subcontractors, there are both direct and indirect advantages from the internal VE activities as well as from VECs. The most obvious direct advantage is that the defense contractor shares in the cost savings that accrue from implementing VECs. Therefore, it is a tool for increasing the contractor's profit through proposed changes in contract requirements.

A major indirect advantage for contractors and subcontractors, is an enhanced competitive position in the Defense industry by producing required products at lower costs. An active VE program establishes a contractor's reputation as a cost-conscious producer, a reputation that is beneficial in today's market. For negotiated contracts, VE successes may be considered when determining the Government's fee objective for the contract. Thus, a contractor with an active VE program might obtain a larger fee than a contractor without one, with all other variables being equal. The net result of a successful VE program is an improved profit position, while the Government acquires needed defense capability with a minimum expenditure of tax dollars.

1.5 VE in Government Contracts

VE provisions are contained in the FAR which specifies the overall procurement policies for the DoD. These provisions enable the Army to reward a contractor for his initiative and ingenuity in identifying and successfully challenging nonessential contract requirements. These clauses encourage Government procurement of better, lower-cost defense items. Parts 48 and 52 of the FAR contain detailed discussion of the VE policies, procedures, and contract clauses.

1.6 VE Terminology

Value Engineering Project: A preplanned effort to study a specific area or task, with the primary objective to reduce cost while maintaining required functions using VE methodology.

Function: The purpose or use of an item or process. The VE approach first concerns itself with what the item or process is supposed to do. The consideration of function is the fundamental structure of the VE method, for all applications by all users.

Value: The relationship between the worth or utility of an item (expressed in monetary terms) and the actual monetary cost of the item. The highest value is represented by an item with the essential quality available at the lowest possible overall cost which will reliably perform the required function at the desired time and place.

Worth: The lowest cost to reliably achieve the required function. Worth is established by comparison of various alternatives which would accomplish that function, and by the selection of the lowest-cost alternative.

Cost: The monetary amount necessary to acquire an item.

A list of acronyms associated with VE and widely accepted in the VE field appears in Appendix A.

1.7 Summary

VE has become recognized as an effective tool for reducing DoD costs. Employed in an organized effort, it is a systematic procedure for analyzing requirements and translating these into the most economical means of providing essential functions without impairing essential performance, reliability, quality, maintainability, or safety. Experience has shown that the beneficial impact of VE is not limited to economic improvement. Significant improvements also occur in other areas which are not always readily measurable in monetary terms, such as performance and ease of use.

CHAPTER 2

VE APPLICATION

2.1 Introduction

VE is directed toward analyzing the functions of an item. In this respect, it differs from most other cost reduction techniques. The VE technique starts with a determination of the required function and then seeks lower cost alternatives to achieve that function. The objective is to identify and eliminate unnecessary cost without loss in quality or reliability.

A VE program includes a planned and organized set of specific tasks that support or apply the VE discipline to all major cost elements of an organization. Well-defined procedures indicate the essential steps of the process, and the execution of these steps generally involves the participation and coordination of personnel with diverse backgrounds.

Knowledge of VE techniques, however, is of little value if not used effectively. As in any profitable program or business, the successful VE program is based on an adequate return on investment. Similar to the selection of a product line, i.e., anticipated contribution to profit, the selection of VE projects should be based on the potential yield from the time, talent, and cost which will be invested. The selection procedure should involve the ranking of possible projects in order of potential return and probability of implementation. This enables the manager to determine which projects are likely to be the best investment.

VE has proved effective in environments such as the engineering laboratory, test facilities, procurement operations, construction projects, manufacturing facilities, and maintenance depots. It has been applied to a broad spectrum of items, procedures, systems, and equipment.

2.2 Identifying Best Value

Function analysis develops a "statement of function" for each part or element of the item being studied. Functions are classified as basic and secondary. A basic function is one that cannot be eliminated without degrading the usefulness of the end item. A secondary function is not essential to operate the item in its intended application, but is a consequence of the selected design solution. Limiting secondary functions and minimizing the costs of all functions results in a "best value" item which is consistent with performance, reliability, quality, maintainability, logistics support, and safety requirements. Best value is achieved when an item reliably performs the required basic function at an appointed time and place and at the lowest total cost.

2.3 Early vs Later VE

The life cycle of a system or equipment begins with the determination that an operational threat exists or a new military capability is needed. Figure 2-1 illustrates a common situation in which the savings potential decreases as the program ages. Early VE tends to produce greater savings (or cost avoidance) for two reasons. First, more units are affected by the savings actions. Second, earlier changes lower implementation costs such as testing, modifications to production lines, retooling expenses, and changes to operational support elements (e.g., spares, manuals, and maintenance facilities). VE should be applied as early as possible in the life cycle.

VE SAVINGS POTENTIAL DURING LIFE OF A TYPICAL SYSTEM

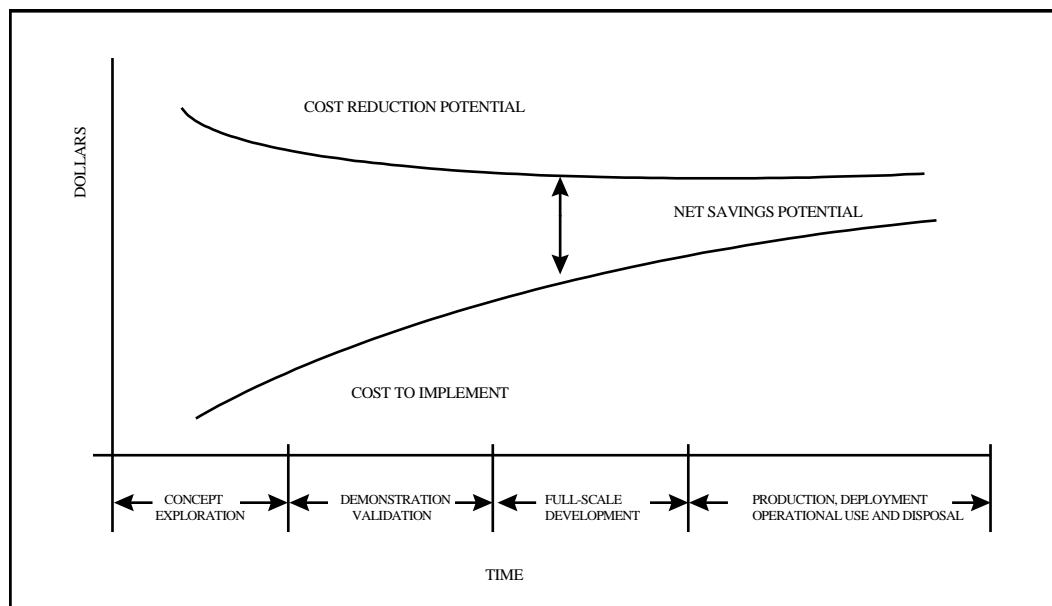


Figure 2-1. Potential of Value Engineering Effort

VE late in a program is precluded only in those rare instances where the cost of the VE effort and subsequent implementation would be greater than the savings potential. While later VE normally adds implementation costs and affects smaller quantities, such deterrents can be more than offset by improved performance through advances in technology, additional available resources, and more time made possible by additional orders. Opportunities for certain types of proposals are frequently enhanced later in the life cycle: deletion of quality assurance testing which cannot be proposed until considerable experience is acquired and data gathered to prove that it is feasible and deletion of management reports generally required to understand the complex situation early in a program that turn out to be unnecessary during later phases of the program.

There are usually some opportunities which offer net savings at any stage of a program. For instance, one contractor who was advised that it was probably too late in the program to submit VECs, persisted and submitted VECs for an additional three years. Of the 22 VECs submitted since the perceived cutoff, 12 were implemented, with significant cost savings generated.

The VE opportunity may be extended because the product life and total requirements are not known. Many items of defense material will be reprocurd indefinitely. There is no sure way to determine the total quantity that will be purchased. Examples are: clothing, ammunition, fire extinguishers, tires, etc. Many items, which entered the defense inventory in the past, were never value engineered and often benefit from a VE effort to the same extent as previously value engineered products. The potential for VE savings on these items is real. Advances in technology or changes in user requirements provide a basis for potential savings.

Thus, VE may be applied at any point in the life cycle of an item or system where it is profitable to do so. Selection of the most appropriate time is influenced by many factors. Two of the most important are the magnitude of the savings likely from the effort and the ease or difficulty with which VE may be applied.

VE in early stages is characterized by benefits which are difficult to measure. Often resulting "cost avoidances" are simply approximated. Later VE results in "before and after" examples whose savings may be forecast with greater accuracy.

2.4 Project Selection

2.4.1 Introduction. Although much attention is focused on the VE opportunity throughout the life cycle of a typical hardware system, VE is not limited to hardware. Other possible VE applications within the defense environment include: materials, organizational functions, software, construction, technical data, etc. Almost anything within the assigned responsibility of an activity offers potential opportunity. In the early stages of a VE program, sophisticated project selection criteria are not usually needed. Frequently there are numerous areas in which the need for VE is obvious and which offer a substantial return on investment.

Those involved in establishing a new VE program or revitalizing a dormant one should select early projects that are most susceptible to VE. Initial projects should be selected that:

- (1) Involve a large dollar program cost.
- (2) Merit attention for reasons other than cost (e.g., deficiencies in performance, reliability, producibility).
- (3) Are of interest to system or executive management.

As the VE program matures and the opportunities become less obvious, additional criteria may be used to select subsequent tasks. Guidelines for each specific possibility are too numerous to be included in this pamphlet, however, some additional characteristics usually exhibited by worthwhile candidates are:

- (1) No known deterrents such as exorbitant test costs or implementation schedule requirements.
- (2) A product with excessive complexity.
- (3) A design that utilizes the most advanced technology.
- (4) An accelerated development program.
- (5) An item which field use indicates is deficient in some characteristics such as high failure rate, low reliability, or low availability.
- (6) An item utilizing older technologies for which modernization appears very promising.

2.4.2 Project Selection Methods. There are two basic methods for project selection that can be used alone or in combination:

- (1) Relative Cost Ranking - The estimated costs of the parts or components of the project under consideration are ranked from highest to lowest in terms of dollar per unit of product and total dollars per product. Potential value improvement is generally greatest on those components with the highest total costs.

(2) ABC Analysis - This method is an extension of the relative cost ranking technique. To apply analysis: 1) List every component, 2) determine unit cost of each, 3) multiply unit cost by annual quantity, and 4) arrange them from the highest to lowest annual expenditure. High expenditures fall into the "A" category, low expenditures into the "C" category, and medium expenditures into the "B" category. Determining the distribution of item or component expenditures facilitates the process of decreasing those expenditures using VE techniques. The matrix structure for ABC Analysis is shown in Figure 2-2.

	CATEGORY	PRODUCT	UNIT COST	ANNUAL USAGE	ANNUAL EXPENDITURES
A					
B					
C					

Figure 2-2. Matrix Structure for ABC Analysis

2.5 VE in Product Development

2.5.1 Introduction. The application of VE should not be confined to changing existing designs to achieve cost reduction. In such applications, the costs of redesigning and testing, scheduling restraints and other factors could offset the potential savings. The most opportune time to apply VE methodology is during research and development, especially during advanced or engineering development, so that any cost savings can be realized throughout the complete life cycle of the end product. In these early phases, VE can be implemented with relatively little or no production and logistics costs.

The basic objectives in applying VE during research and development are to reduce the high cost of development, the subsequent cost of production, and the consequent costs related to operation and maintenance. To achieve the basic objectives, VE should be accomplished BEFORE production begins, BEFORE interchangeability factors are found, BEFORE field or technical manuals are drafted, and BEFORE logistic support plans are finalized.

The application of VE early in the design phase of the product life cycle can produce certain tangible benefits:

- (1) Maximum savings will result from changes made at this time since changes will be applied to the *first* production unit.
- (2) Fewer modifications to production lines, tooling, processes, and procedures, thereby reducing implementation and product costs.
- (3) Fewer drawing changes.
- (4) Fewer post-production changes to logistic and support elements such as manuals, maintenance facilities, and spare parts requirements.

2.5.2 Methods of Application.

(1) **Function Evaluation Studies.** This method involves a multiple approach technique for achieving functional requirements. Detailed evaluations of the technical requirements are made and their effects on total performance are determined. Concurrently, the effect on system (or item) cost of each alternative being considered is determined and related to the individual technical requirements. Areas of high cost and high cost sensitivity are identified, and the associated requirement is examined in relation to its contribution to system (or item) effectiveness. The requirements identified by these high cost areas are examined in detail from a cost effectiveness standpoint. The elements of disproportionately high cost then become the subject of additional study using other methods of analysis. This analytical evaluation of function provides useful data on the optimum system arrangement, and system cost is introduced as a basic design parameter.

(2) **Development Department Value Engineering.** Although an organization may have competent engineers on its development staff, it does not necessarily follow that design costs are automatically minimized. In this regard, value engineers should be assigned as value consultants of the development engineering organization to help develop alternative ways of providing the required function in order to reduce production costs. Value engineering training will also assist in motivating development and test engineers to apply the VE methodology in generating best value designs.

(3) **VE Membership on the Product Development Team.** The product development team concept has been gaining much acceptance and support by Government and Industry under the auspices of the Concurrent Engineering (CE) approach. CE is the simultaneous development of a product's design, manufacturing process and maintenance procedure features with the purpose of expediting the product development process, reducing overall product cost, and maximizing quality. This is an approach which challenges the traditional serial and highly segregated product development process. As an example, the members of a product development team might consist of the following engineers, each with primary areas of responsibility:

- (a) Development engineer - performance.
- (b) Manufacturing engineer - producibility.
- (c) Quality control engineer - quality.
- (d) Maintenance engineer - maintainability.

Since the primary responsibility of these engineers is their specialty, another member - a value engineer - should be included on the team. The specialty of this engineer in value analysis would improve the overall effectiveness of the team. Management can also assist by establishing certain requirements to ensure VE will be accomplished during development. The value engineer should ensure that user requirements are well founded. Target costs should be based on current costs to meet operational requirements plus cost of unique new features. The value engineer should place emphasis on identifying real requirements and eliminating unnecessary design restrictive requirements established by the user or design community.

(4) **VE Consideration at Review Points.** To assist in managing their products, most military and civilian activities have established a list of important review points throughout the development process. Army R&D review points are structured to prove concept feasibility, concept validation, development acceptance and production validation. These reviews can be additionally effective if VE is made a mandatory review milestone.

2.5.3 Cost Target Program. A cost target program is a method used to identify and establish cost targets

during the development phase through predicted or estimated data. A cost target is a feasible dollar goal for specified elements of an item's acquisition cost, assigned in accordance with a work breakdown structure and Design to Cost (DTC) principles (Joint Logistics Commanders DTC Guide). Cost targets for individual hardware items should not be confused with the target cost of incentive contracts.

The objectives of the cost target program are to identify individual subsystems or items that need VE study at one or more points before production begins, and to serve as input to stimulate cost reduction. This program helps control costs by integrating the efforts of the engineering, manufacturing, and quality departments. It further provides designers with production cost data that should motivate them to use cost as a design parameter, and also provides early detection of unnecessary costs in time to take corrective action. Through this program, it is hoped that designers will use VE techniques or will consult value practitioners on matters of cost.

One characteristic of the program is a repetitious feedback of a predicted cost for an end item at several points (e.g., in-process reviews) during the design process. A sample validation in-process review checklist is provided in Figure 2-3. Each feedback provides an under-target, over-target, or on-target signal. Under-target items are evaluated for possible target reduction; over-target items should become subject of intensive VE study. No action is needed for on-target conditions. Final evaluation of effectiveness is performed when the verification point (usually a delivery point during fabrication) is reached. At that time, the actual cost of each targeted item is compiled in the same type work breakdown structure as the basic cost model that was used in preparing the cost target.

(1) VE responsibility might include:

- (a) Generation of the procedures for incorporating VE considerations into existing procedures.
- (b) Performance of the VE analytical effort preceding the reviews.
- (c) Generation of VE checklist to be used by the design or specification personnel as preparation for review board evaluation.
- (d) Representation on the review board.

(2) If a cost target program is included as part of the VE program, it should be integrated with the validation review activity. The cost target that has been developed as a design requirement is compared with the estimated costs of the design alternatives under review. This comparison will not only provide a more accurate measure of cost effectiveness of the particular unit being studied, but it also will point up the cost variables that affect related designs, indicate any need for additional value study, and help support the review decisions.

GENERAL

1. Have the specifications been critically examined to see whether they ask for more than is needed?
2. Has the cost of any overdesign been defined for its effect on production, operation, and maintenance as well as on the research and development program?
3. Has the cost effect of contractually required overdesign been discussed?
4. Has the field of commercially available packaged units, subassemblies, and circuits been thoroughly reviewed to ensure that no standard supplier items can be used?
5. Have suggestions been invited from prospective suppliers regarding possible value improvement from loosening specification requirements?
6. Does the design give the user only what he needs and no more?
7. Could cost be reduced by a reduction, within allowable limits, of performance or reliability and maintainability?

PARTS SELECTION AND EVALUATION

1. Have appropriate standards been consulted for selection of standard components?
2. Can a redesign replace a nonstandard part with a standard part?
3. Have all nonstandard parts been identified and approved?
4. Has the design been coordinated with similar designs, circuits, parts, or components to benefit from past experience?
5. Are the standard circuits, standard components, and standard hardware the lowest-cost items that will supply the minimum required characteristics?
6. Can the use of each nonstandard part or circuit be adequately justified?
7. Do control drawings leave no question that a supplier's standard part is being specified when such is intended?
8. Has standardization been carried so far that the cost of excess function is greater than the gains resulting from the use of standard parts?

SPECIFICATIONS

1. Does the specification state minimum essential requirements? Could it be tailored to minimize effort and cost?
2. Is its resultant cost effect upon the product comparable to the worth gained by the specification?
3. Is each specified requirement essential?
4. Is the resultant cost effect of the aggregate of each needed requirement comparable to the worth gained?
5. Is the resultant cost effect of the tolerance specified on each requirement comparable to the worth gained?
6. Is the resultant cost effect of each referenced or incorporated specification justified by the worth derived?

Figure 2-3. Sample Validation In-Process Review Checklists

2.6 Summary

The choice of techniques varies with the phase of the life cycle and the situation in which the VE study is initiated. Between the conceptual and operational phases of a product, the available time, talent, and factors to be considered change. Although VE studies conducted in the conceptual and validation phase may offer a maximum opportunity for value improvement, potential dollar savings are often difficult to validate since there is generally no formal cost baseline with which to compare cost improvements. VE may be profitably employed early in the life cycle to challenge basic requirements and analyze preliminary designs. Also, functional trade-offs, systems analysis, and operations research techniques play a greater role than in later VE. Cost-estimating techniques also differ significantly since some details of the design may have to be assumed.

As a product progresses along its life cycle, the VE methodology must be adapted to conform to the situation and the available data. Initially, VE projects may be selected on the basis of dollar volume, complexity, and level of management interest. Later, as projects with significant potential become less obvious, selection may be based on such additional factors as test costs, state of the art technology, degree of development, time compression, and field-problem reports.

CHAPTER 3

OVERVIEW OF VE FUNDAMENTALS AND TECHNIQUES

3.1 Introduction

A task which is accomplished in a planned and systematic manner is more likely to be productive than one which is unplanned and relies upon undisciplined ingenuity. VE efforts follow a structured method to assure results. This procedure is termed the VE Job Plan. It is designed as a group undertaking because it relies on the synergy of diverse backgrounds to optimize the creative process. This chapter explains the VE Job Plan as it would be employed in a specific VE study. It is intended to impart a basic understanding of VE techniques; however, attendance at a hands-on Value Engineering workshop is strongly recommended in order to become proficient in performing a formal VE study. Workshops are available from the Army Management Engineering College (AMEC), SAVE International, several universities and VE consulting firms.

One of the cornerstones of an effective VE effort is the generation of ideas which can be developed into feasible proposals. To accomplish this efficiently, it is common practice to utilize contributions from specialists representing many disciplines and form a team amalgamating their specialties with VE. Those team members who are VE specialists provide direction and guidance to assure that the VE Job Plan is followed. The other specialists are used to gain new insight and generate new ideas. They not only contribute their own capabilities but usually have ready access to additional specialists. Although it is not necessary for all team members to have had previous VE training, it is desirable. Each member of the team contributes a pattern of thinking which is characteristic of his or her specialty and experience. Each member tends to stimulate other team members to contribute their characteristic patterns of thinking. Each can determine and discuss the effect another's idea will have on his or her own area of interest.

No single phase of the VE Job Plan should be assigned as a secondary responsibility on a part-time basis with the expectation that collectively VE will be accomplished. Experience has proven that a VE effort is most productive when all personnel involved in the team actively participate in all phases of the VE Job Plan.

The group dynamics of a VE team effort produce benefits which the efforts of one individual can seldom match. Among the prominent benefits are:

- (1) More talent is directly applied to the problem.
- (2) The scope and depth of the effort is increased.
- (3) More efficient use is made of the available time because problem areas are more readily resolved through direct communications.
- (4) Team participation provides productive training for those not previously exposed to formal VE training and serves as a refresher course for those with previous VE training.
- (5) The synergistic effect of a diverse group working in harmony toward a common objective.

3.2 The VE Job Plan

Several versions of the VE Job Plan can be found in current VE literature. Some texts list five phases, others six, and some refer to more. The complexity of the study sometimes influences the number of phases selected, however, the number of phases is less important than the systematic approach implied. This chapter describes a seven-phase VE Job Plan. It encompasses the same fundamentals contained in other VE Job Plans (Figure 3-1). There are no sharp lines of distinction between the phases. They tend to overlap in varying degrees and generally require several iterations through many of the phases of the plan.

An effective VE effort must include all phases of the Job Plan. However, the proper share of attention given to each phase may differ from one effort to another. The Job Plan represents a concerted effort to organize the study so that all alternatives will be considered and the final selection will represent the optimum in value.

The remainder of this chapter is devoted to describing and discussing the essential elements of the various phases of the Job Plan as they occur in a typical VE effort.

3.3 Orientation Phase

Most organizations have limited VE resources available for a large number of projects; therefore, project selection should be based on maximizing return (maximum cost reduction or other benefit) for the total VE investment. In the early stages of the VE program, the selection process may be quite simple but when the obvious projects are depleted, the need for a systematic project selection procedure materializes. Guidelines for the selection of projects may mean little in a specific situation. Due to the wide variety of situations, the VE management approach may be different. Since identifying cost/function/worth relationships is a way to identify VE opportunities, these techniques can also be used to identify preliminary projects. Throughout the selection process one way to help ensure success is to make sure management is aware of the potential of the VE technique, the capability of VE personnel, and those decisions necessary to fully utilize the available VE resources.

3.4 Information Phase

3.4.1 Introduction. The information phase of the Job Plan has two basic objectives:

(1) To obtain a thorough understanding of the system, operation or item under study by a rigorous review of all of the pertinent factual data.

(2) To define the value problem by means of functional description accompanied by an estimate of the worth of accomplishing each function. Worth can be defined as the lowest cost to perform a function reliably.

3.4.2 Key Questions. During this phase, the following key questions must be answered:

- (1) What is it?
- (2) What does it do?
- (3) What must it do?
- (4) What does it cost?

(5) What is it worth?

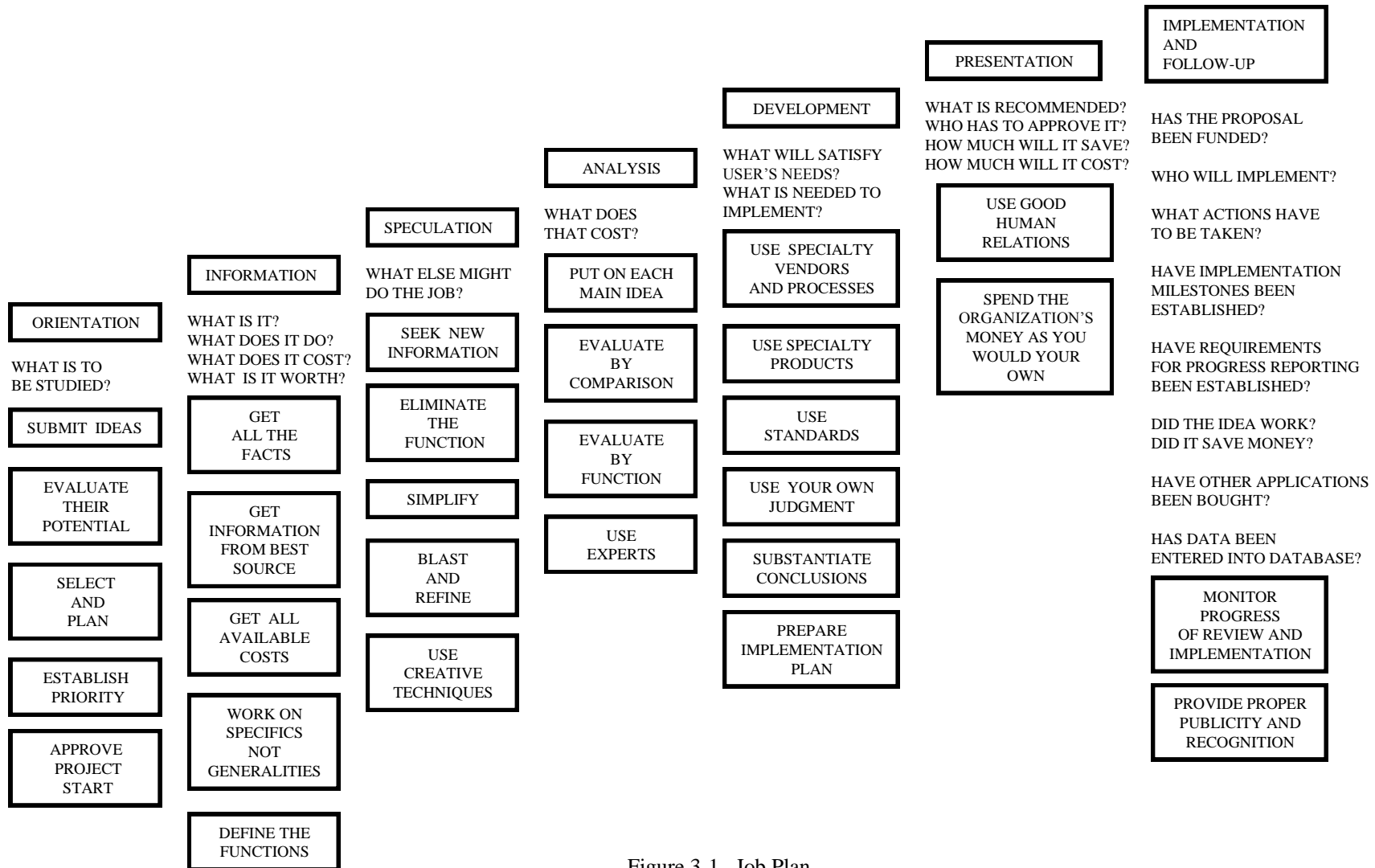


Figure 3-1. Job Plan

3.4.3 Procedures.

(1) Collecting information. All pertinent facts concerning the system, operation or item must be drawn together. The paramount considerations are getting all the facts, and getting them from the best sources. The VE team should gather complete information consistent with the study schedule. All relevant information is important, regardless of how disorganized or unrelated it may seem when gathered. The data gathered should be supported by tangible evidence in the form of copies of all appropriate documents. Where supported facts are not obtainable, the opinions of knowledgeable persons should be documented. In addition to specific knowledge of the item, it is essential to have all available information concerning the technologies involved, and to be aware of the latest technical developments pertinent to the subject being reviewed. Knowledge of the various manufacturing processes that may be employed in production of the item or the various steps in a procedure is essential. The more information brought to bear on the problem, the more likely the possibility of a substantial cost benefit. Having all the above information would be the ideal situation, but if all of this information is not available, it should not preclude the performance of the VE effort.

(2) Determine functions. The focus on function is what sets VE apart from other product and process improvement approaches. The fundamental tool used for defining, modeling and analyzing functions is the FAST. Chapter 4 of this pamphlet contains an overview of the principles and applications of FAST.

Function, the specific purpose or intended use for an item or project, is that characteristic which makes it work or sell. In short, it is why the owner, customer, or user buys a product. Function is closely related to use value, or the properties and qualities which satisfactorily and reliably accomplish the intended use. The determination of function is a requisite for all value studies. The decision to pursue the project through the remaining phases of the Job Plan can only be made by determining function, placing a worth on each function, and then comparing the worth against actual or estimated cost. The determination of function should take place as soon as sufficient information is available to permit determination of true requirements. All members of the VE study team should participate in this exercise since the determination of function is vital to the subsequent phases of the Job Plan.

(3) Evaluate functions. After the functional description has been developed, the next step is to estimate the worth of performing each basic function. The worth determined should be compared against the estimate of the item's cost. This comparison indicates whether the study should be terminated because worth and cost are approximately equal or pursued because cost greatly exceeds worth.

3.5 **Speculation (Creative) Phase**

3.5.1 Introduction. Creative problem-solving techniques are an indispensable ingredient of effective VE. The best designs, construction methods, systems or processes are the result of creative solutions which are a step beyond what is now in hand. Creative techniques can be employed in all phases of project management from the earliest identification of requirements and criteria to actual design, construction, operation and maintenance.

3.5.2 Techniques for Creative Problem Solving. Creative thinking, particularly in the area of generation of ideas, should be used in all phases of a project. In VE, a number of techniques are used which assist in the identification of value problems, the generation of ideas which suggest solutions, the analysis of these for feasibility, and finally the development of practical solutions. Brainstorming, is a problem solving technique used extensively in VE studies. There is no specific combination of techniques which is prescribed for all VE efforts, nor is there a predetermined degree to which they should be utilized. The selection of specific techniques and the depth to which they are utilized is primarily a matter of judgment and varies according to

the complexity of the subject under study.

The ground rules for creative idea generation may be summarized as follows:

- (1) Do not attempt to generate new ideas and to judge them at the same time. Reserve all judgment and evaluation until afterwards.
- (2) Generate a large quantity of possible solutions. As a goal, multiply the number of ideas produced in the first rush of thinking by 5 or even 10.
- (3) Seek a wide variety of solutions that represent a broad spectrum of attacks upon the problem.
- (4) Watch for opportunities to combine ideas as they are generated.
- (5) Do not discard any idea, even if it may appear most impractical.
- (6) Do not ridicule any ideas.
- (7) Before closing the book on possible solutions, allow time for subconscious thought on the problem while consciously performing other tasks.

3.5.3 Enhancing Creative Thinking. A conducive atmosphere for creative endeavor is no doubt the most important factor in development of a productive program. Each level of management must establish a creative environment in its area of responsibility. Subordinates must be encouraged to engage in creativity. Some guidelines to positive action are:

- (1) Establish and initiate a policy that encourages creative ideas.
- (2) Initiate a training program which explores creative techniques.
- (3) Establish a policy to encourage identification of areas for improvement.
- (4) Provide open and objective evaluation of all recommendations.
- (5) Encourage employees to discuss decisions that involve their task assignments.
- (6) Identify individuals who have constructive, creative ideas and allow them freedom to perform to their own professional standards even though their ideas may be opposed to current policy.
- (7) Establish brainstorming teams for free-wheeling and constructive thinking without organizational restrictions.
- (8) Establish an incentive recognition and awards program to identify all of the individuals or groups that contribute to creativity and productivity.
- (9) Encourage flow of information both up and down within the organization and develop group loyalty and mutual confidence.

3.5.4 Negative Factors Affecting Creativity. There are many negative factors and attitudes that affect creativity. Creative solutions are like new ideas and are very fragile. People who speak up about their ideas

may feel fragile and vulnerable, knowing that they have just opened themselves up to criticism. It is a general rule that criticism and analysis are ruled out during the early expression of new ideas. There are mental attitudes or influences which serve to retard or block the creative process. These blocks may be categorized as habitual, perceptual, cultural, and emotional.

(1) Habitual Blocks.

- (a) Continuing to use "tried and true" procedures even though new and better ones are available.
- (b) Rejection of alternate solutions which are incompatible with habitual solutions.
- (c) Lack of positive outlook, lack of effort, conformity to custom, and reliance on authority.

(2) Perceptual Blocks.

- (a) Failure to use all the senses for observation.
- (b) Failure to investigate the obvious.
- (c) Inability to define terms.
- (d) Difficulty in visualizing remote relationships.
- (e) Failure to distinguish between cause and effect.
- (f) Inability to define the problem clearly in terms that will lead to the solution of the real problem.

(3) Cultural Blocks.

- (a) Desire to conform to "proper patterns, customs or methods."
- (b) Over-emphasis on competition, or on cooperation.
- (c) The drive to be practical above all things - too quick to apply judgment.
- (d) Belief that all indulgence in fantasy is a waste of time.
- (e) Faith only in reason and logic.

(4) Emotional Blocks.

- (a) Fear of making a mistake or of appearing foolish.
- (b) Fear of supervisors and distrust of colleagues.
- (c) Over-motivation to succeed quickly.
- (d) Inability to reject decisions which are adequate but which are obviously sub-optimum.

- (e) Difficulty in rejecting a workable solution and searching for a better one.
- (f) Difficulty in changing set ideas - no flexibility - depending entirely upon judicial (biased) opinion.
- (g) Lack of drive in carrying a solution through to completion or implementation.
- (h) Refusal to take a detour to reach a goal.
- (i) Inability to relax and let incubation take place.

3.6 Analysis Phase

3.6.1 Objectives. The purpose of this phase is to select for further analysis and refinement the most promising alternatives from among those generated during the previous phase. During the speculation phase there is a conscious effort to *prohibit* any judicial thinking so as to not inhibit the creative process. In this phase all the alternatives must be critically evaluated since many of them may not be feasible. The alternatives are studied individually and grouped for the best solution. The following questions must be answered during this phase:

- (1) What does each alternative cost?
- (2) Will each alternative perform the basic functions?

3.6.2 Techniques. Several techniques are available by which alternatives can be evaluated and judged. Comparisons can be made between the various features of similar alternatives under consideration. Advantages and disadvantages of each alternative can be listed and then the ideas sorted according to their relative advantages and disadvantages.

3.6.3 Procedure. Evaluation may be accomplished either by the generating group or by an independent group. Authorities disagree upon which approach is better. The disagreement grows out of the question as to whether people who generate the ideas can be objective enough in evaluating them.

(1) Evaluation criteria. The first step is to develop a set of evaluation criteria-standards by which to judge the ideas. In developing these criteria, the team should try to anticipate all of the effects, repercussions, and consequences that might occur in trying to accomplish a solution. The resultant criteria should, in a sense, be a measure of sensitivity to problems (which might be inherent in changes caused by the new idea).

(2) Screening process. The next step in the procedure is the actual ranking of ideas according to the criteria developed. No idea should be discarded; all should be given this preliminary evaluation as objectively as possible. Ratings and their weights are based on the judgment of persons performing the evaluation. This initial analysis will produce a shorter list of alternatives, each of which has met the evaluation standards set by the team.

(3) Establishing costs of alternatives. The remaining alternatives are then ranked according to an estimate of their relative cost reduction potential. The ranking may be based on nothing more than relative estimates comparing the elements, materials, and processes of the alternatives and the original or present method of providing the function. The surviving alternatives are then developed further to obtain more detailed cost estimates. The cost estimating for each alternative proceeds only if the preceding step

indicates it still to be a good candidate. Although the analysis phase is the responsibility of the VE team, authorities and specialists should be consulted in estimating the potential of these alternatives. Cost estimates must be as complete, accurate, and consistent as possible to minimize the possibility of error in assessing the relative economic potential of the alternatives. Specifically, the method used to cost the original or present method should also be used to cost the alternatives.

(4) Final selection. After the detailed cost estimates are developed for the remaining alternatives, one or more are selected for further study, refinement, testing, and information gathering. Normally, the alternative with the greatest savings potential will be selected. However, if several alternatives are not decisively different at this point, they should all be developed further.

The following forms (Figures 3-2, 3-3, 3-4, 3-5) can be used in analyzing those ideas deemed fitting for final consideration. The idea surviving this process will be the one selected for VEP development.

3.7 Development Phase

3.7.1 Objective. In this phase, the alternatives which have survived the selection process are developed into specific recommendations for change. The process involves not only detailed technical and economic analysis but also an assessment of the probability of successful implementation.

3.7.2 Key Questions. Several questions must be answered during the development of specific solutions. These are :

- (1) Will it work?
- (2) Will it meet all necessary requirements?
- (3) Who has to approve it?
- (4) What are the implementation problems?
- (5) What are the costs?
- (6) What are the savings?
- (7) Is there enough future production and support need to justify the VE action?

3.7.3 Procedures.

- (1) General. Each alternative must be subjected to :
 - (a) Careful analysis to ensure that the user's needs are satisfied.
 - (b) A determination of technical adequacy.
 - (c) The development of estimates of costs, implementation expenses, including schedules and costs of all necessary tests.
 - (d) Consideration of changeover requirements and impact.

ANALYSIS CHECKLIST:

- ✈ What ideas seem feasible?
- ✈ Have all alternatives been evaluated? (Figure 3-3)
- ✈ Can any be modified or combined with another?
- ✈ Have all feasible alternatives been retained?
- ✈ What are their savings potential?
- ✈ What are the chances for implementation?
- ✈ What might be affected?
- ✈ Will it be relatively difficult or easy to make a change?
- ✈ Will each idea satisfy user needs?
- ✈ Has a list of the most feasible of ideas been compiled? (Figure 3-4)
- ✈ Is there an existing inventory of parts that must be used prior to implementation?
- ✈ Has a "Draft" VE proposal been presented to affected parties? (Figure 3-5)

CONSIDER EVERYTHING!

BE REASONABLE! BE FAIR!

Figure 3-2

ANALYSIS PHASE		FEASIBILITY RANKING					
STUDY NO.							
FUNCTION							
List the ideas that have, in your judgment, ability to meet the required criteria. Rank each idea from 1 to 10 for these factors:							
		TOTAL RANKING					
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							
16.							
17.							
18.							
19.							
NOW IS THE TIME TO JUDGE							

Figure 3-3

ANALYSIS PHASE		IDEA COMPARISON
STUDY NO.		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		

Select the most feasible ideas or combination of ideas. List them below. List both the advantages and disadvantages of each idea to determine where additional work must be done.

[illegible]

KEEP AN OPEN MIND

Figure 3-4

2) Develop convincing facts. As in the Information Phase, the use of good human relations is of considerable importance to the success of the Development Phase. The VE team should consult with personnel knowledgeable about what the item must do, within what constraints it must perform, how dependable the item must be, and under what environmental conditions it must operate. Technical problems related to design, implementation, procurement or operation must be determined and resolved. Consideration also must be given to impact in areas such as safety, fire protection, maintenance and supply support.

(3) Develop specific alternates. Those alternatives that stand up under close technical scrutiny should be followed through to the development of specific designs and recommendations. Address specifics rather than generalities. Prepare drawings or sketches of alternate solutions to facilitate identifying problem areas remaining in the design and to facilitate detailed cost analysis. Perform a detailed cost analysis for proposed alternatives to be included in the final proposal.

4) Develop implementation plans. Anticipate problems relating to implementation and propose specific solutions to each. Particularly helpful in solving such problems are conferences with specialists in relevant areas. Develop a specific recommended course of action for each proposal that details the steps required to implement the idea, who is to do it, and the resources required.

(5) Testing. When testing is involved, the VE team may arrange the necessary testing and evaluation involved, although normally this will be done by appropriate personnel in the organization. Testing and evaluation should be planned for and scheduled in the recommended implementation process.

(6) Select first choice. Finally, one alternative should be selected for implementation as the best value (best cost reduction) alternative, and one or more other alternatives selected for presentation in the event the first choice is rejected by the approval authority. The implementation schedule which will yield the greatest cost reduction should also be indicated.

3.8 Presentation Phase

3.8.1 Objective. This phase involves the actual preparation and presentation of the best alternatives to persons having the authority to approve the VE proposals. This phase of the VE Job Plan includes the following steps:

- (1) Preparing and presenting the VE proposals.
- (2) Presenting a plan of action that will ensure implementation of the selected alternatives.
- (3) Obtaining a decision of positive approval.

3.8.2 Discussion. A VEP is a challenge to the "status quo" of any organization. It is a recommendation for change, developed through a team effort and dependent upon another team effort for its adoption. The success of a VE program is measured by the savings achieved from implemented proposals. Regardless of the effort invested and the merits of the proposals, the net benefit is zero if the proposals are not implemented. Presenting a proposal and subsequently guiding it to implementation often require more effort than its actual generation. This paragraph reviews some principles and practices which have been successfully used to facilitate the approval of VE submissions.

3.8.3 Form. Presentation of a VEP should always be made in written form. Oral presentation of study results is most helpful to the person who is responsible for making the decision; however, it should never

replace the written report. A written report normally demands and receives a written reply; whereas oral reports can be forgotten and overlooked after they are presented. In the rush to wrap up a project, promote a great idea, or save the laborious effort of writing a report, many proposals have fallen by the wayside because the oral presentation came first and was inadequate. The systematic approach of the VE Job Plan must be followed all the way through to include the systematic, meticulous, careful preparation of a written report. From this will evolve a more concise and successful oral presentation.

3.8.4 Format. A format for a typical VE study should be a brief summation of each phase of the Job Plan. It should be thorough but brief.

3.8.5 Content. Management personnel responsible for review and approval must base its judgment on the documentation submitted with a proposal. The proposal and supporting documentation should provide all of the data the reviewer will need to reach a decision. Top management is primarily concerned with net benefit. A manager may either be competent in the areas affected by the proposal or he may rely on the advice of specialists. In either case, completely documented proposals are far more likely to be implemented. Generally, proposals should contain sufficient discussion to assure the reviewer that item/system performance is not adversely affected, supporting technical information is complete and accurate, potential savings are based on valid cost analysis, and the change is feasible.

3.8.6 Gaining VEP Acceptance. There are many hints which may be offered to improve the probability of success and reduce the time required for acceptance and implementation of proposals. Those which appear to be most successful are discussed in the following paragraphs.

(1) Consider the reviewer's needs. Use terminology appropriate to the training and experience of the reviewer. Each proposal is usually directed toward two audiences. First, is the technical authority who requires sufficient technical detail to demonstrate the engineering feasibility of the proposed change. Second, are the administrative reviewers for whom the technical details can be summarized while the financial implications (implementation costs and likely benefits) are emphasized. Long-range effects on policies, procurement, and applications are usually more significant to the administrator than to the technical reviewer.

(2) Progress reports - "no surprises." The manager who makes an investment in VE study expects to receive periodic progress reports with estimates of potential results. Reporting is a normal and reasonable requirement of management. It helps assure top management awareness, support, and participation in any improvement program. There are very few instances where managers have been motivated to act by a one-time exposure at the "final presentation," no matter how "just" the cause. Therefore, it is advisable to discuss the change with the decision-makers or their advisors prior to its submittal as a formal VEP. This practice familiarizes key personnel with impending proposals, and enables them to evaluate them more quickly after submittal. Early disclosure may also serve to warn the originators of any objections to the proposal. This "early warning" will give the originators opportunity to incorporate explanations and details to overcome the objections. Often, these preliminary discussions produce additional suggestions which improve the proposal and enable the decision maker to contribute directly. They also provide opportunities for the VE practitioners supervisor to anticipate problems or objections in the organization at his level and to perform preliminary coordination and defusing of potential controversy. If management has been kept informed of progress, the VEP presentation may be only a concise summary of final estimates, pro and con discussion, and perhaps formal management approval.

(3) Relate benefits to organizational objectives. The VEP which represents an advancement toward some approved objective is most likely to receive favorable consideration from management. Therefore, the presentation should exploit all of the advantages a VEP may offer toward fulfilling organizational objectives

and goals. When reviewing a VEP, the manager normally seeks either lower total cost of ownership, or increased capability for the same or lesser dollar investment. The objective may be not only savings but also the attainment of some other mission-related goal of the manager.

(4) Support the decision-maker. The dollar yield of a VEP is likely to be improved if it is promptly implemented. Prompt implementation in turn, is dependent upon the expeditious approval by the decision-makers in each organizational component affected by the proposal. These individuals should be identified and the entire VE effort conducted under their sponsorship. The VE team becomes the decision-maker's staff, preparing information in such a manner that they can weigh the risk against the potential reward. Like any other well prepared staff report, each VEP should :

- (a) Satisfy questions the decision-maker is likely to ask.
- (b) Permit the decision-maker to preserve his professional integrity.
- (c) Provide assurance that approval would benefit the organization.

(d) Include sufficient documentation to warrant a favorable decision with reasonable risk factors (both technical and economic).

(5) Minimize risk. If proposals presented to management are to be given serious consideration, they should include adequate evidence of satisfactory return on the investment. Often, current or immediate savings alone will assure an adequate return. In other cases, life cycle or total program savings must be considered. Either way, evidence of substantial benefits will improve the acceptability of a proposal. The cost and time spent in testing to determine the acceptability of a VE proposal may offset a significant portion of its savings potential. Committing such an investment with no guarantee of success constitutes a risk which could deter acceptance of a VEP. This risk may be reduced by prudent design and scheduling of test programs to provide intermediate assurances indicating the desirability of continuing with the next step.

(6) Combine testing. Occasionally, a significant reduction in implementation investment is possible by concurrent testing of two or more proposals. Also, significant reductions in test cost can often be made by scheduling tests into other test programs scheduled within the desirable time frame. This is particularly true when items to be tested are a part of a larger system also being tested. However, care must be exercised in instances of combined testing to prevent masking the feasibility of one concept by the failure of another.

(7) Show collateral benefits of the investment. Often, VE proposals offer greater benefits than the cost improvements specifically identified. Some of the benefits are collateral in nature and difficult to equate to monetary terms. Nevertheless, collateral benefits should be included in the proposal. The likelihood of acceptance of the VEP is improved when all its collateral benefits are clearly identified and completely described.

(8) Acknowledge contributors. An implemented proposal always results from a group effort. There is a moral obligation to identify all individuals and data sources contributing to a proposal. Identification of contributors also provides the reviewers with a directory of sources from which additional information may be obtained. Individuals and organizations should be commended when it is deserved. This recognition promotes cooperation and participation essential to the success of subsequent VE efforts.

3.8.7 Oral Presentation. The oral presentation can be the keystone to selling a proposal. It gives the VE team a chance to ensure that the written proposal is correctly understood and that proper communication exists between the parties concerned. Effectiveness of the presentation will be enhanced if :

- (1) The entire team is present and is introduced.
- (2) The presentation lasts no longer than 15 minutes with time for questions at the end.
- (3) The presentation is illustrated through the use of mockups, models, slides, vu-graphs, or flip charts.
- (4) The team is prepared with sufficient backup material to answer all questions during the presentation.

3.9 Implementation Phase

3.9.1 Objective. During this phase, the VE project team must ensure that approved recommendations are converted into actions. Until this is done, savings to offset the cost of the study will not be achieved. Three major objectives of this phase are :

- (1) To provide assistance, clear up misconceptions, and resolve problems that may develop in the implementation process.
- (2) To minimize delays encountered by the proposal in the implementation process.
- (3) To ensure that approved ideas are not modified during the implementation process in such a manner that compromise would cause them to lose their cost effectiveness or basis for original selection.

3.9.2 Implementation Investment. The need to invest in order to save must be emphasized when submitting VEPs. Some degree of investment is required if a VE opportunity is to become a reality. Funds for implementation have to be provided. The key to successful implementation lies in placing "work orders" for the necessary actions into the normal routine of business. Progress should be reviewed periodically to ensure that any roadblocks which arise are overcome promptly.

3.9.3 Expediting Implementation. The fastest way to achieve implementation of an idea is to effectively utilize the knowledge gained by those who originated it. Whenever possible, the VE team should be required to prepare first drafts of documents necessary to revise handbooks, specifications, change orders, drawings and contract requirements. Such drafts will help to ensure proper translation of the idea into action and will serve as a baseline from which to monitor progress of final implementation. To further ensure proper communication and translation of the idea onto paper, the VE team should review all implementation actions prior to final release.

3.9.4 Monitoring Progress. Implementation progress must be monitored just as systematically as the VE study. It is the responsibility of the VE study team to ensure that implementation is actually achieved. It is suggested that a person be designated with responsibility to monitor all deadline dates in the implementation plan.

3.10 Follow-up Phase

The last phase of the Job Plan has several tasks which might seem quite diverse, but when completed in total, will serve to foster and promote the success of subsequent VE efforts. These tasks are listed below.

- (1) Obtain copies of all complete implementation actions.

- (2) Compare actual results with original expectations.
- (3) Submit cost savings or other benefit reports to management.
- (4) Submit technical crossfeed reports to management.
- (5) Evaluate conduct of the project to identify problems encountered and recommend corrective action for the next project.
- (6) Publicize accomplishments.
- (7) Initiate recommendations for potential VE study on ideas evolving from the study just completed.
- (8) Screen all contributors to the VEP for possible receipt of an award and initiate recommendation for appropriate recognition.

3.11 Summary

The VE job plan is the framework upon which a successful effort is built. When utilized properly, it assures a systematic approach to the identification of a value opportunity. It provides for a thorough understanding of the subject including a quantitative identification of the nature and worth of the functional requirements. Uninhibited creative effort then may suggest alternative approaches to achieve all functions needed by the user. This is followed by a series of evaluations to select, develop, and implement the alternative offering the best opportunity for value improvement. No project is complete until proposals are implemented, results tallied, and new knowledge exploited as fully as possible.

The VE Job Plan can be applied to any subject suitable for a VE study. In serving as a vehicle to carry the study from inception to conclusion and in observing certain formalities, the VE Job Plan ensures that consideration is given to all necessary facets of the study. Although the Job Plan divides the study into a distinct set of work elements, judgment is necessary to determine the depth to which each phase is performed. In fact, each plan must be made in light of the resources available and the results expected. The VE Job Plan requires the study to clearly define the functions performed by the item under study. Adherence to the Job Plan ensures that time is made available for the essential creative work and its necessary analysis so that best choices can be made for further development. The Job Plan leads to the establishment of an effective program aimed at the selection of the best value alternatives. And, finally, it concludes with specific recommendations, the necessary data supporting them, the identification of necessary implementing actions, a proposal implementation schedule and a required follow-up procedure.

The Job Plan is normally followed in sequence, phase by phase. However, in actual practice it is often necessary to do additional work to a previously completed phase before reaching a decision. Thus, in practice, the phases may overlap broadly, and such early steps as information gathering may continue throughout most of the VE effort. Typically, two major documents are produced: a report summarizing the results of the effort and a project book that contains all the detailed backup information. The VE Job Plan is an approach that has been tested, is being used, and has proved to be workable.

The VE Job Plan may be keyed to the word "value" in this manner:

- (1) Validate the information as it is assembled.
- (2) Alternatives, listing all possibilities.
- (3) Look closely at each idea; analyze and evaluate possibilities.
- (4) Use suitable alternatives; develop them into sound suggestions.
- (5) Evaluate and recommend the best alternatives for implementation.

CHAPTER 4

FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST)

4.1 What Is FAST and What Makes It Unique?

4.1.1 Function Analysis System Technique (FAST). FAST is a unique, disciplined way of thinking, a methodology used to identify, depict and analyze functions and function relationships with the objective of improving their interaction to more efficiently achieve the end objective. Function is the end result desired by the customer; it is what they buy. It is the requirement, the goal, the objective, it is not an action, it is the result of an action.

The identification and analysis of functions represents the foundation upon which VE is based and separates it from the variety of process and product improvement initiatives throughout Government and industry. FAST was developed by Mr. Charles W. Bytheway in 1964, and first presented and published as a paper at the 1965 International Conference of the Society of American Value Engineers.

While the methodology of FAST is deceptively simple, the application is difficult. It is so simple to understand that it is frequently mistaken for common sense. The application of FAST requires a change in thinking habits, making it necessary to apply strict discipline to encourage innovation and keep from reverting to the same old way of thinking.

4.2 Applications, Management and FAST Team Formation

4.2.1 FAST Applications. FAST has been historically proven to be applicable to a broad range of subjects including: product design and development; manufacturing processes; administrative and organizational systems; design and construction of major facilities; personnel and community affairs; strategic planning; product/process understanding; program/organization planning; decision making/decision impact; and problem solving.

4.2.2 FAST Team Formation. A multi-disciplined FAST Team, consisting of cognizant personnel from the functional organizations, supported by an experienced VE staff, performs function model development, analysis, evaluations, and proposal preparation. During this process, organizational concepts that control the project under examination are studied.

FAST Team participants represent three areas;

- the problem owners - management;
- the problem solvers - FAST Team participants; and
- those impacted by the problem solution - the internal and external customers.

The advantages of this approach are;

FAST Team responsibility for creating, processing and implementing proposal recommendations encourages Team members and sponsoring organizations to "buy-in" to team-generated ideas and become owner-committed to project implementation.

FAST provokes teamwork. The common language of "function", applied to a multi-disciplined group, eliminates the territorial responsibilities that generally separate such groups. Adversarial,

confrontational relationships are discouraged because each participant is stimulated, through mutual responsibility, to participate as a team player to achieve problem resolution. The subsequent merging of thought and approach establishes a team with common interests that will not support adversity but rather encourages "win-win" cooperation and generates understanding of the impact of decisions upon one another.

(a) FAST Team Selection. The level of ideas and the subsequent projects developed by the FAST Team reflect the level of experience and responsibility of the participants. The level of effort also influences the quality of the resulting FAST model.

FAST Team participant selection is therefore based upon technical ability to solve the problem under study, a vested interest in its successful resolution, innovative ability to think freely, and ability to transfer to others the knowledge gained as a FAST Team member.

(b) Training. If possible, FAST Team participants should participate in a FAST Workshop so they have an understanding of what is expected of them. Participants should be taught to prepare for and participate in the workshop resolution of live problems. A formal course in FAST should be a prerequisite for the Team Leader, but not necessarily the Team members.

4.3 Function Analysis

4.3.1 Define Function. There are three principle characteristics that govern how functions are identified and analyzed.

Functions are described using 2 words, an active verb and a measurable noun.

The noun in the function description is generic. Products or "things" that are used for the noun describe an action or activity of a function. As an example; "enclose space" would be a function. "Construct building" describes one way to "enclose space".

Functions can be defined as basic or secondary. Basic functions describe the principle reason for the existence of a product, process or structure. Failure of a basic function causes the loss of the market value of that item. Once a function is classified as "basic" that function cannot change. However, the manner in which that function is implemented is subject to innovative analysis. "Secondary" (or supporting) functions describe features, attributes and the approach to implement the basic function(s). Unlike basic functions, secondary functions can be modified, combined or eliminated if the objectives of the VE study are satisfied.

4.3.2 Analyze Function. There are a variety of ways to analyze functions, all of which have a common goal. That goal is to relate function to cost, which is an expression of value. Focusing on the function to cost relationship, rather than the cost of "things", allows the value analyst to break through the veneer of superficiality and cut to the heart of the issues.

(a) Random Function Determination. This basic method involves randomly selecting elements of the project under study and determining their functions. Once defined, the functions are classified as basic or secondary. Cost data is then allocated to the functions producing a function to cost ratio. This ratio identifies potential areas for improving value.

(b) FAST. The FAST process states that functions exist because they are dependent upon other functions for their existence the way components are dependent upon other components to make a system work (See Figure 4-1, Basic FAST Model).

4.3.3 FAST Methodology. FAST is a structured utilization of intuitive logic. FAST allows effective communication, across disciplines and technologies, to separate cause from effect in the resolution of root problems. The intuitive logic of FAST requires that functions be identified using an active verb and a measurable noun. The objective of the verb-noun definition, however, is not to provide answers but to help the team ask the correct questions, questions that will lead to creative opportunities that produce outstanding results. This approach stimulates understanding of the process under study, exposes non-value added functions and affects the use of a common language, all of which encourages team-work.

(a) HOW and WHY. FAST accelerates understanding the process under study because the discipline of FAST requires that participants use the language of verb-noun to describe the performance requirements of functions that make up the process. This vocabulary, concentrating on HOW things happen and WHY they happen, allows participants to quickly assess the salient elements of the process. This common language cuts across all disciplines to become the key that opens understanding of how decisions or actions impact process functions.

Finding the proper verb and noun that complies with the function definition is often tedious but rewarding. For example -

A spring does not move parts, it "stores energy".
 A screw driver does not turn screws, it "transmits torque".
 A supervisor does not control people, he/she "manages resources".

A major strength of FAST is the technique of questioning and focusing on which functions must be performed to achieve the desired result, and how best to achieve those functions rather than merely accepting previous methods and activities. Each function is then identified as contributing or not contributing added value to the product or process to justify its contribution to cost and quality of performance. Those not contributing are exposed as valueless, marginal activity.

In the FAST model, function dependencies are determined by establishing "HOW" the function is performed, and "WHY" the function is performed. Lack of a specific and acceptable response to each question indicates the presence of valueless functions and, therefore, the presence of marginal activity.

Example: A number of functions can be selected from a list of components of an office building:

1. Enclose Space
2. Create Habitat
3. Condition Environment
4. Regulate Temperature
5. Manage Traffic
6. Protect Inhabitants
7. Ventilate Enclosure

If one were to select the function "Condition Environment" for analyses, the function "Create Habitat" would satisfy the WHY question and "Enclose Space" would satisfy the HOW question. The orientation of these questions is to read HOW from left to right and WHY from right to left.

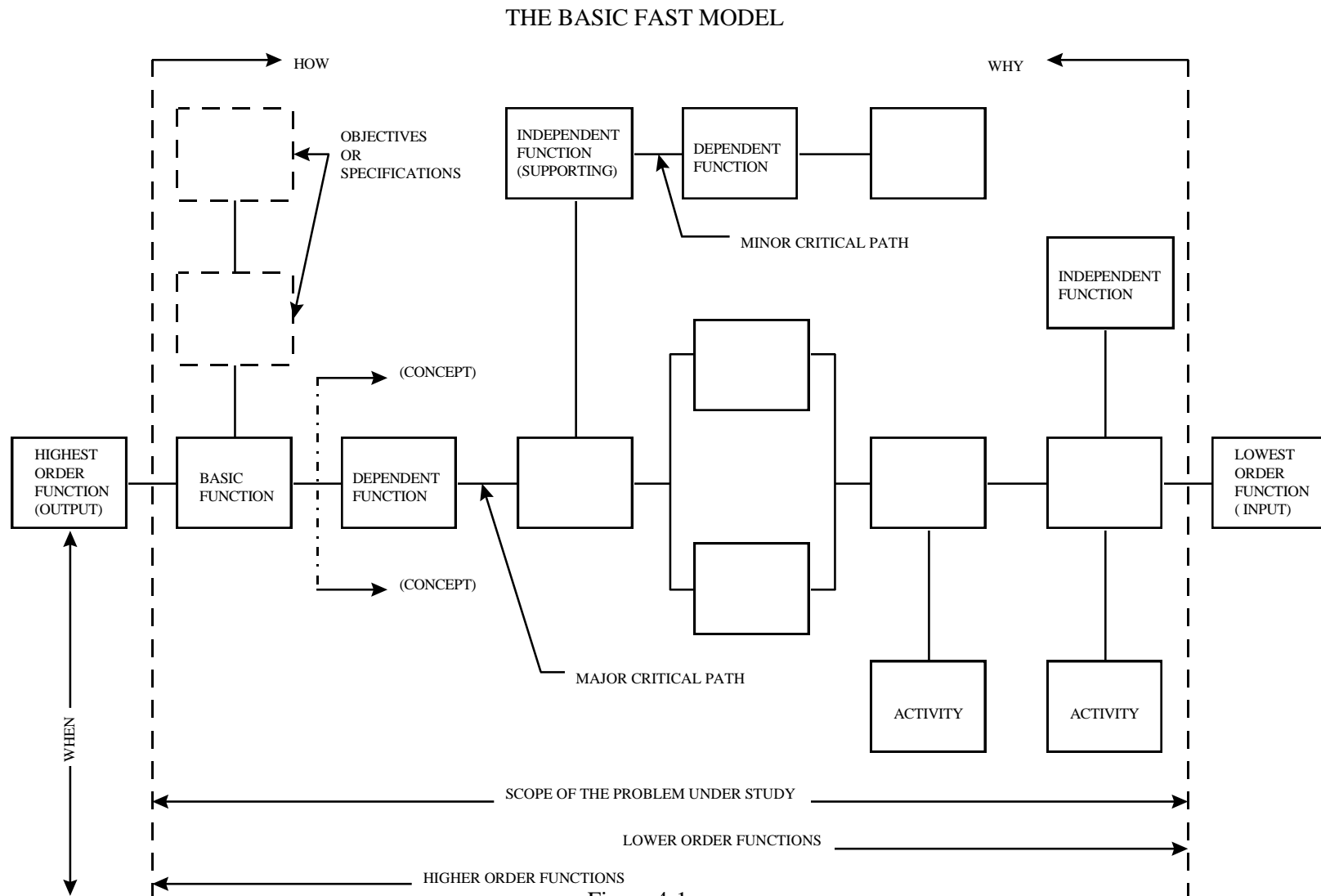
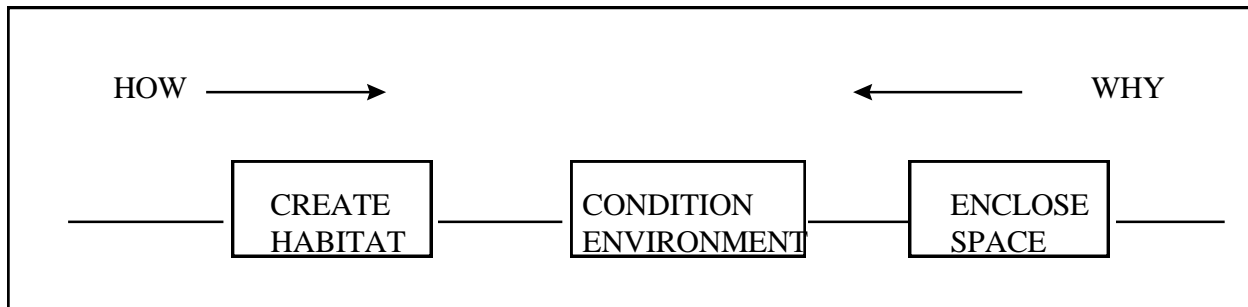


Figure 4-1.

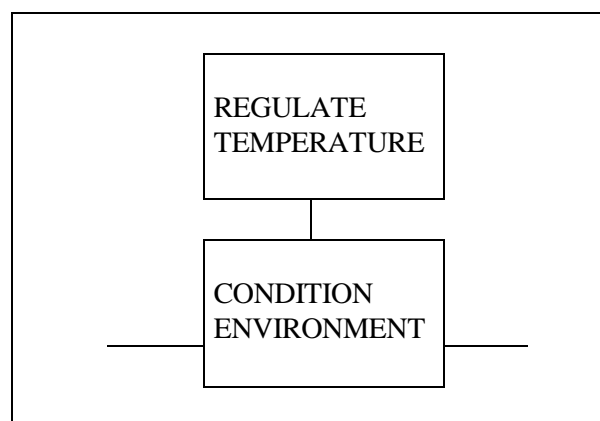


In the above example, reading the HOW direction the questions would be: How do you create habitat? By conditioning environment. And how would you condition environment? By enclosing space. Reading in the WHY direction the questions would be: Why would you enclose space? To condition the environment. And why would you condition the environment? To create a habitat. If the logic is correct, the model can be expanded in either direction.

The answers to these questions are also functions, which link to form a graphical illustration of the project under study. Reading the resultant FAST model in the HOW direction must satisfy the function logic. Reading the model in the WHY direction must satisfy the project's system logic.

(b) WHEN. Although WHEN is not an intuitive logic question, it is used to identify cause and effect, or activities that result when a function is active. In this context, WHEN does not indicate time. Although time can be added to the model as part of the analyses, the function model focuses on function dependencies to satisfy the intuitive logic, not time.

Graphically, WHEN is linked to the function in question in the vertical plane. As an example, in evaluating the function "Condition Environment" it could be said that "... when you condition the environment you must regulate temperature". This would be expressed graphically as follows:

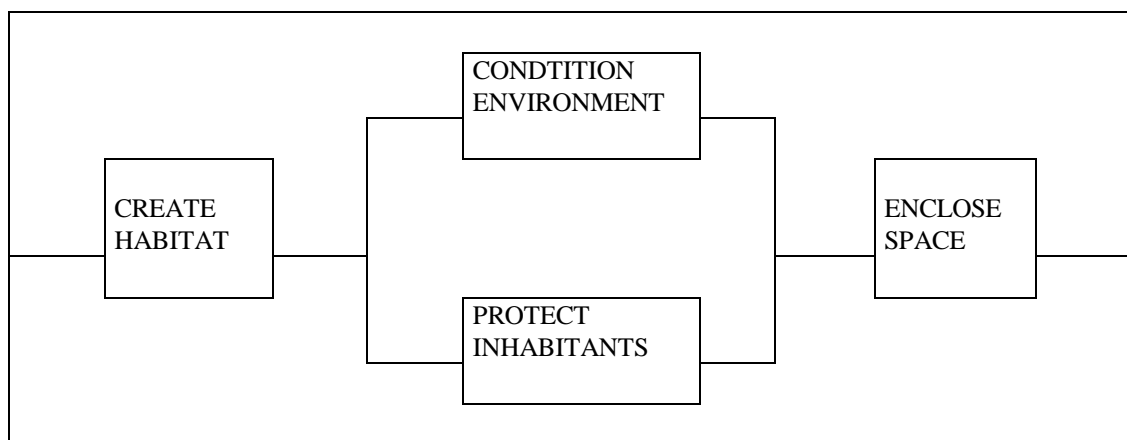


"Regulate Temperature" is considered a function, rather than an activity, because the noun "temperature" is generic.

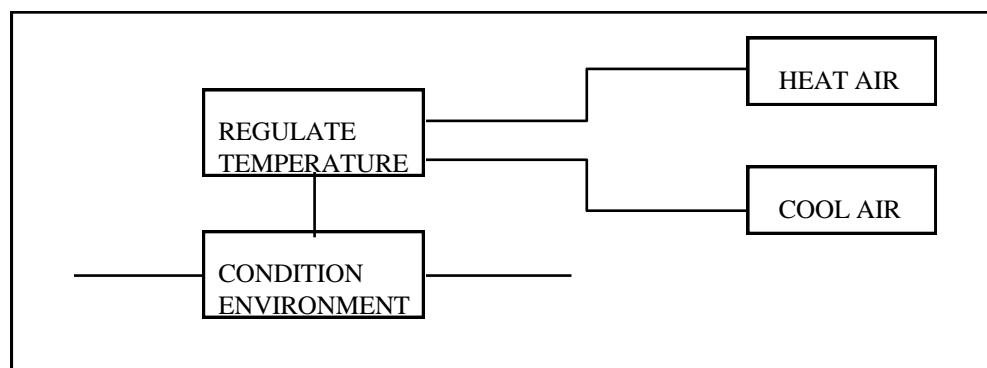
To test the WHEN dependency ask; "If I didn't have to "Condition Environment" would I still have to "Regulate Temperature"? If the answer is "no", "Regulate Temperature" is dependent on "Condition Environment". If the answer is "yes", "Regulate Temperature" is independent and would not be connected to the function in question.

(c) AND and OR. The use of AND and OR is graphically illustrated when more than one function is necessary to answer the intuitive logic questions (AND), or when a clear choice of functions exists that satisfy the intuitive logic questions (OR).

As an example, it can be argued that creating a habitat requires protecting the inhabitant as well as conditioning the environment. This would be expressed functionally as; "How do you Create Habitat"? by "Condition Environment" AND "Protect Inhabitants". This would be illustrated as follows:



As example of the use of OR would be in asking the question: "How do you regulate temperature"? By "Heating Air" OR "Cooling Air". This would be illustrated as follows:



We can continue the dialogue and expand the function model by agreeing that: "... When we "Enclose Space", we must "Ventilate Enclosure". Why? to "Evacuate Contaminants". Also, when we "Enclose Space" we must "Manage Traffic". Notice that ventilation, in this model, is not dependent on air temperature but on evacuating contaminants that collect in an occupied, enclosed space.

Putting it all together thus far, the function model would appear as shown in Figure 4-2.

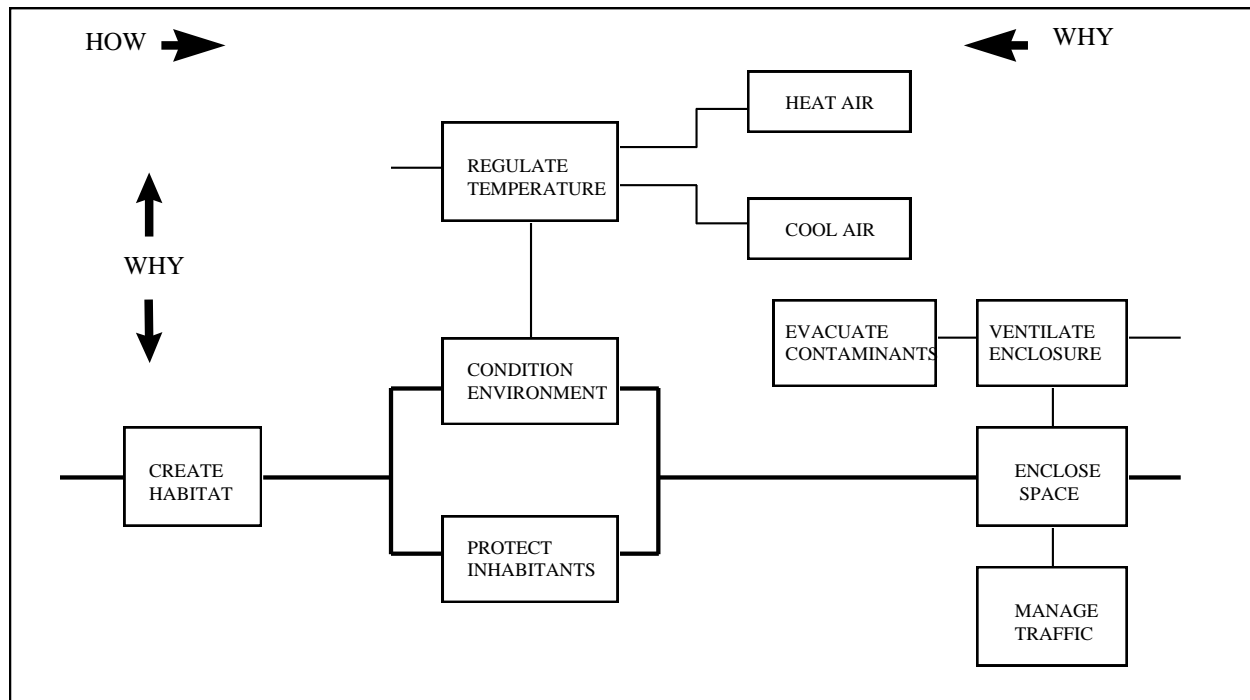


Figure 4-2

4.4 Defining the Scope of the FAST Model

Conceptually, we can continue to build the function model by adding functions in the WHY and HOW directions, and expanding those functions in the WHEN direction. The modeling process is considered complete when the VE Team agrees that the model reflects the problem or opportunity to be resolved. This is illustrated by adding vertical "scope lines" to the function model, as shown in Figure 4-3.

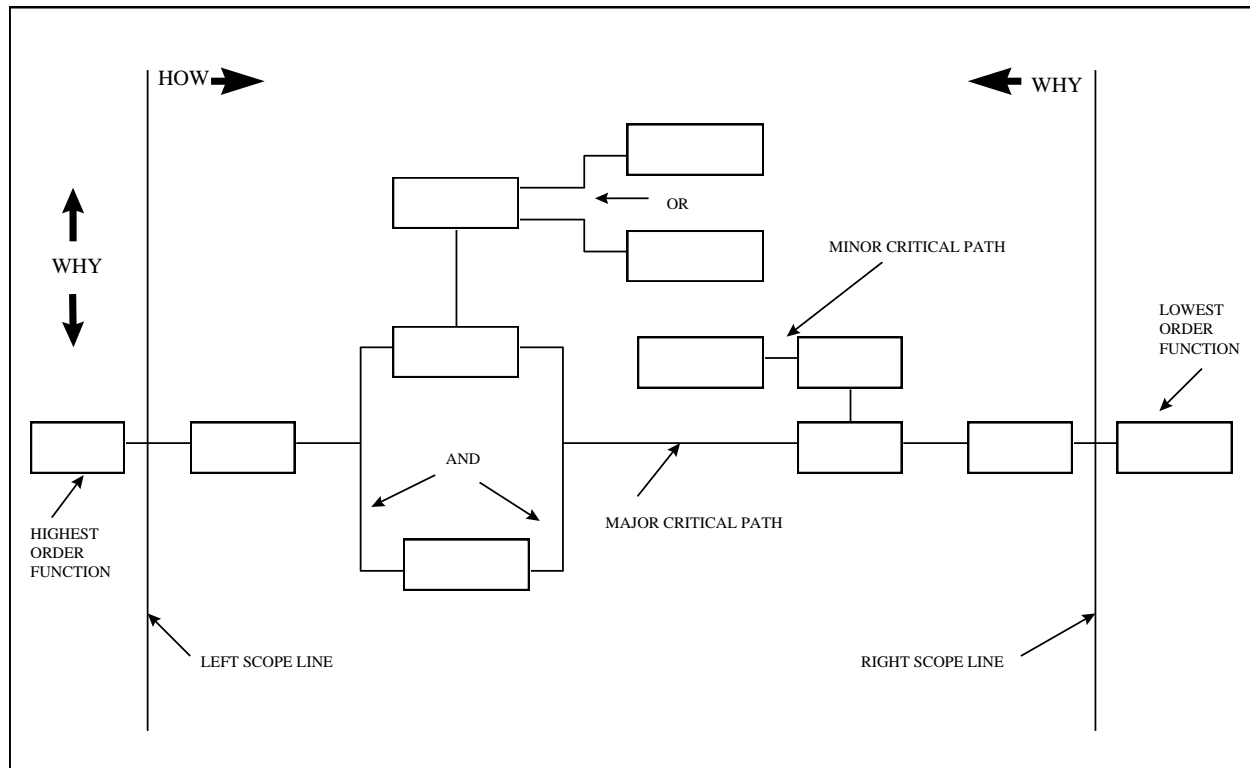


Figure 4-3

The area between the scope lines graphically describes the functions and their dependent relationship under study. The function(s) to the right of the right scope line shows the input functions, or functions related to, but outside the study scope. The function(s) to the left of the left scope line describe highest order functions, or the objective(s) of the study. The functions to the immediate right of the left scope line are defined as basic functions. Functions to the right of the basic function(s) are considered secondary, or supporting functions (refer to the description of basic and secondary functions above).

The horizontal (X axis) function path that joins the basic function is called the "Major Critical Path". If a function along this path is disturbed it will significantly alter the way the basic function(s) work. Other horizontal function paths are called "Minor Critical Path(s)". Changing the functions on these paths will change attributes, features or support functions, but would not significantly alter the basic function.

After placing the scope lines on the function model the team should relate the model to the problem statement and study objectives to assure comparability.

4.5 Developing a FAST Model

In summary, the sequence of steps needed to effectively build a FAST model include:

1. Construct Major Critical Path first.
2. Build along the HOW direction.
3. Test along the WHY direction.
4. Think 3 moves ahead.
5. Test the logic.

6. Check for "AND" and "OR" splits.
7. Position Scope lines.
8. Add WHEN functions.
9. Test the logic.
10. Select key functions for creative analysis.

4.6 Summary

The FAST discipline is a rapid and effective methodology to teach, model, analyze and develop products and processes to encourage cost containment, and increase productivity while improving quality. It builds the foundation for an effective VE effort or any other product and process improvement initiatives.

4.7 Questions and Answers

Q1. *The three questions asked before starting a FAST Diagram; Why are they asked?*

A. The questions are:

1. What is the problem we are about to discuss?
2. Why do you consider this a problem?
3. Why is a solution necessary?

The questions are used at the opening of a workshop to insure that all members of the VE task team are addressing the same problem, and to surface any "hidden agendas". The questions are also asked when FAST is used to "functionalize" a new product or management issue. Contained within the answer statement to the three questions, which must have the consensus of the team, are verb/noun "functions" describing the approach and level of abstraction of the problem that the team will address. The second and third questions, starting with "why" are also directional reference questions. The right-to-left directions leads you to higher order functions thereby forcing an examination of where to place the left scope line. Once placed, the function(s) to the immediate right of that line are basic, and by definition, they cannot change. Where to place the scope lines is therefore determined after the diagram is complete, to better assess which function(s) should be designated as "basic".

Q2. *Why create a FAST diagram; where is it taking us?*

A. Let us reflect a moment and agree that function analysis is the key of the value discipline. It is the one approach that separates us from just cost reduction. FAST is one of many methods to analyze function. Others include: Random Function Determination, the Function Tree, Numerical Function Analysis, Function Hierarchical, the Function/Cost Matrix, etc., all good, and each effective if properly used. The FAST system has the advantage of using intuitive logic, a system which feeds back and evaluates our input. If a function does not fit in the model, it could be that it is not described properly. Usually the verb must be changed because the "HOW" and "WHY" questions the verb. That's also why the verb used in describing a function should be active, not passive. A missing function, or a function description placing it too high or too low on the model's level of abstraction can also cause the FAST diagram to read incorrectly.

The other function approaches are usually under the influence of a "dominant personality" who decides how to describe the function, and whether it is basic or secondary. Remember, FAST is a communication tool. As such the diagram itself is not as important as the dialogue it stimulates among the team members in attempting to satisfy the model's requirements. You will find the process forces an in-depth discussion of

how things work, their functions, and their dependency on other functions. Once the diagram is complete it can be dimensioned in a variety of ways to establish; goals and objectives for MBO Programs, design-to-cost models, as an effective way to justify proposals and budgets, deciding when to start "speculating", and many other uses.

Q3. *How do you tell the difference between a function and an activity?*

A. By definition, a function is the intended use of an item or system, and an activity is the approach taken to achieve that function. Both can be described using a verb and a noun. Sometimes the noun will tell you it is an activity if it describes hardware or software "products". Activity examples include; open valve, file paper, justify budget, audit receivables. It is not really important whether the "activity" is above, below or on the critical path. What is important is that the more activities you use on the critical path to describe functions, the lower the level of abstraction of your FAST diagram. To intentionally lower the level of abstraction of the FAST diagram then, add activities to the critical path. Conversely, a way to raise the level of abstraction of your diagram is to take activities out of the critical path and put them under (when) the applicable function. However, the How/Why logic must still test after removing those activities. Good FAST model makers, like good checker or chess players, think three moves ahead. Testing the diagram in groups of three is a good approach for maintaining the proper level of abstraction.

Q4. *How does Function Evaluation relate to FAST?*

A. Function Evaluation, or Function Analysis is an approach. FAST is one technique to implement that approach (see Q.2).

Q5. *How do you apply worth and cost to FAST diagrams?*

A. Once the model is complete, the functions can be clustered, or color coded to identify the cost of components or systems. On a portable compressor, for example, the engine, airend, compressor, running gear, etc., can be displayed with their actual and target costs, and further broken down to components within the clusters to suit the problem. The same applies to an organization or procedure, where actual costs and budgets can be assigned to departments and functions within those departments. As to "worth", the market determines the "worth", or how much it is willing to pay for those wanted and needed functions. This has nothing to do with cost. Therefore, rely on market analysis to determine "worth", rather than use some abstract cost-worth relationship. If you need something more specific, use the definition of worth where "Worth is the lowest cost to perform that function reliably".

Q6. *Is it necessary to do an "as-is" diagram, then a "should be" diagram?*

A. No. If you are doing an after-the-fact study, model the "as-is". Look at the functions, the manner in which they are being performed, and (if you have assigned cost) the cost to perform those functions. Then decide which functions you want to address. By changing those functions (except the basic), or changing the way those functions are performed, the subject function will also change all the functions to the right (dependent) of that function. Therefore, the closer to the basic function you begin your speculative phase, the greater the impact and change to the study subject. The same applies to the "before-the-fact" approach, except you do not have a model to use in developing the FAST diagram --- which is an advantage.

Q7. What is the step by step procedure to follow in creating the FAST diagram?

A. The complete answer would require a book, to expand on the areas discussed in this chapter, but here are some hints. For complex after-the-fact projects (hardware or software) I use the conventional Random Function approach to start. That is, list the components, then all their functions, and identify whether those functions are basic or secondary. Then expand them in the "How" and "Why" directions. If there are many functions, (say 50 or more), use only the sub-level or component's basic functions to start building the FAST diagram, concentrating on the critical path first. Then the "when" functions or activities can be added, as appropriate. If other functions are needed (and they will be) the team can draw them from the remaining secondary functions, or write new ones. This usually results in a manageable model at the proper level of abstraction.

Q8. What is the best way to teach FAST?

A. The best approach is not to confound the participants with all the principles, rules, regulations and variations. After they understand how to use the verb/noun syntax and the difference between basic and secondary functions, quickly explain the How/Why dependency, scope line, and "when" functions. Then, using a canned example, lead the participants as they identify the functions and construct the diagram on a blackboard using their inputs. After seeing what they accomplished, then explain the principles, analysis, and the impact on the diagram of changing or modifying functions. This introductory approach takes about 30 minutes, and stimulates the participants to ask questions relating to those important principles you want them to learn. It also gives them the confidence to use FAST on their assigned project. The more they work with live problems, the greater will be their knowledge and appreciation of the FAST technique.

Q9. Why don't people agree on one way to create FAST diagrams?

A. There is only "one way", that is the intuitive logic principle developed by Charles Bytheway involving the How/Why dependency, the critical path, and the scope lines. Everything else is a variation on the basic concept. There is nothing wrong with variations, they should be encouraged. However, the value practitioner should learn principles first, so that the process can be built upon without losing those basics.

CHAPTER 5

HUMAN RELATIONS IN THE VE PROGRAM

5.1 Importance of Human Relations in the VE Program

How VE team members conduct themselves in dealing with others is a prime factor in the success or failure of a study. For a successful VE program, people from all levels in an organization must cooperate and become a part of the dynamic and creative spirit that is basic to VE. Each person must be treated as an individual with a unique contribution to make to the team effort. The ability to recognize existing or potential problems in human relations places one well along the path to a solution. This chapter deals with the causes of many human relations problems and offers some suggestions. Three types of interaction between people involved in a VE study should be considered:

- (1) Contacts between members of the VE study group and their sources of information; e.g., designers, estimators, administrators, and users.
- (2) Relations within the VE study group.
- (3) Contacts with persons who have the authority to approve or disapprove the changes recommended by the VE team.

5.2 Principles of Social Behavior

Development of favorable attitudes for, and acceptance of, a new concept occur over a period of time. They can be generated by favorable individual experiences building upon one another. Each team member can make an important contribution toward gaining enthusiastic acceptance of VE in their organization by following the general principles of social behavior described below:

(1) Empathy. In all dealings with other people, it is helpful to have empathy - the ability to imaginatively place oneself in another's shoes. Successful use of empathy in dealing with people requires that these questions be asked:

- (a) What do they say?
- (b) What do their actions indicate?
- (c) What do they really believe?
- (d) Why do they believe this way, act as they do, and say what they do?

Answers to these questions will provide an insight into understanding others. A state of relaxed objectivity and freedom from control by emotions should be maintained. This use of empathy paves the way for selecting a workable approach to whatever attitude is encountered.

(2) Honesty. If the team member will remember that there is just one member of an organization involved in a total effort, the human relations part of the job should come easily. In most cases, those consulted contribute time and technical ability to the VE effort with little chance of praise or recognition for their contributions. For this reason, broad credit for contributions to a successful VE study should be given.

It is essential that all VE team members demonstrate the highest degree of integrity in their work and interactions with others.

(3) Individuality. Every person brings to the job his own unique collection of ideas, habits, and perceptual processes. Individuals approach problems in their own ways and their designs are products of their own perceptions and sensitivities. Their cooperation will be more readily obtained if they are convinced that their competencies are recognized and essential to the success of VE efforts.

(4) Thoughtfulness. People are committed to established procedures and they don't change easily. VE study team members should exercise patience with people who will be required to change their thinking and procedures to implement a VE change. Changing ways of doing business that have been in place for a long time will require a complete selling job by VE team members. Care must be taken to minimize and depersonalize criticism of past practices.

(5) Positive Thinking. Positive thinking has been suggested as an effective means of overcoming the natural fear of change. In order for VE team members to exhibit this trait, they must be sufficiently grounded in the basic VE techniques to demonstrate confidence in their application.

(6) Flexibility. The VE team member must be aware of changing technology and circumstances and be receptive to changes and updates that may need to be introduced into on-going VE studies.

5.3 Overcoming Roadblocks

A roadblock has been defined as "a negative response based on an irrelevant assumption." It is described as a decision, attitude, or situation which prevents progress. Roadblocks are natural hazards to the benefits which would flow from VE changes and both VE practitioners and managers must be able to effectively deal with objective criticisms and roadblocks. Understanding why roadblocks develop and responding diplomatically with the facts will go a long way toward removing roadblocks.

Roadblocks can be easily recognized. In their most common form, they take shape as verbal barriers. These verbal barriers are then followed by a lack of cooperation. In the minds of persons using them, roadblocks are the best reasons in the world and do not require further development. Non-emotional, courteous, and factual responses are effective in dealing with roadblocks.

Any change can meet resistance. Many people are hostile or anxious in the face of a change that might even remotely be considered a threat to their pattern of living. Some of the reasons for such emotional resistance to change are:

(1) If the nature and effect of a proposed change are not clearly explained, and understood, it may be considered a threat. Incomplete information produces insecurity; and insecurity can turn to hostility.

(2) Different people interpret proposals in different ways, particularly if the suggestions are vague and not based on fact.

(3) When there is great pressure for change, and great pressure against it, resistance grows, ultimately immobilizing everyone.

(4) The less opportunity a person has to express personal opinion about a proposed change that affects that person, the greater the resistance will be to it.

(5) Proposals that are made on a personal basis, or that reflect on an individual's ability or performance, produce hostility.

(6) Strong resistance can be expected if a change will alter long established institutions, habits, or customs.

5.4 Promote Cooperation

Attention to human relations must be a continuing effort. Some useful rules of conduct for the VE team member to apply in daily tasks are:

- (1) Acquaint people with the nature and objectives of the project.
- (2) Promote VE as a team effort of the entire organization.
- (3) Respect the chain of authority, customs of the organizations and personal characteristics of the people involved.
- (4) Anticipate likely adverse reaction to change.
- (5) Make suggestions, recommendations, and requests clear at all times.
- (6) Make reports clear and accurate.
- (7) Never criticize or belittle the work of an individual on an item under study.
- (8) Be careful with proposals which imply criticism or affect jobs or assignments.
- (9) Always have the facts to back up the proposal or report handy, and be prepared to present them clearly.
- (10) Consult with those who are affected by proposed changes.
- (11) Remember to listen carefully. Avoid just telling people about VE or a specific proposal. Listen to what they say and respond to their thoughts and needs. The person who objects to a proposal may give a clue as to how it may be approved or modified to facilitate approval.
- (12) Show respect for the other person's opinions.

5.5 Summary

The effective practitioner of VE must be able to see the "big picture"; must be able to see the problem through the eyes of management; must be a salesperson, a psychologist, an engineer, an opportunist, and a student of human nature; and, above all, must be sincere in the belief that the VE proposal will result in real savings.

A proposal can be rejected due to technical reasons or purely personal reasons. The real reason must be determined, and if personal, necessary actions must be taken to overcome the individual's biases and established work patterns. In order to assure success, cooperation from people at all levels in an

organization must be gained. Their cooperation must come as part of the creative spirit that is in VE. In most cases, VE is not needed to develop a workable item or to construct it on time. Therefore, the services of VE are looked upon by some as an unnecessary burden thrust upon them to hinder them in the performance of their job. It is necessary to overcome this feeling and instill in all persons a realization of the contribution of VE and a feeling of accomplishment by participation in the program.

CHAPTER 6

CONTRACTUAL ASPECTS OF VE

6.1 Introduction

Before VE clauses were included in Government acquisition regulations, there was little or no financial incentive for a contractor to submit engineering change proposals that saved the Government money. The usual result of Government acceptance of a cost-reduction change proposal was a reduction in the contract value. This reduction was generally accompanied by a comparable reduction in profit or fee. In effect, the contractor was penalized for his efforts to cut costs and his reluctance to participate in cost reduction actions was understandable. Since that time, a positive incentive for the contractor has been created with the development of DoD VE contract clauses.

One of the results of the contract clause inclusion has been contractor-submitted VECPs that offer savings to the Government but do not penalize the contractor. It should be noted that Government acceptance of a VECP does not depend upon it being the result of using VE methodology. In fact, a VECP must meet only two criteria:

- (1) It requires a change to the contract, and
- (2) It saves money for the U.S. Government.

The DoD VE contract clauses encourage contractors to challenge unrealistic Government requirements and specifications and to profit by doing so. These clauses are unlike other contract incentives which reward efficient performance according to the stated terms of the contract. VE contract clauses reward the contractor who proposes changes to the contract which will result in equal or better but lower-cost products. These changes are mutually advantageous to the Government and the contractor because both share the resultant savings. The DoD VE contract clauses encourage entrepreneurs by rewarding contractors equitably for their initiative in developing VECPs.

6.2 Benefits

6.2.1 To DoD. DoD is interested in VE contract clauses for two reasons. First, VE generally improves or updates the product due to the subsequent availability of more information, added insight, or new technology. Second, VE is a convenient means to foster greater economy. An annual goal for VECP savings of one percent of the procurement Total Obligational Authority (TOA) has been suggested by the Deputy Under Secretary of Defense (Acquisition and Technology) as reasonable and attainable. To date reported VECP savings, while impressive, do not reflect the full potential of the contractor VECP program.

It should be noted that the savings that have been reported are based on conservative calculations. It is probable that the actual savings exceeds those reported. The benefits usually remain with the program or command implementing the proposal. The funds which are thus freed can be reapplied for authorized but unfunded requirements. Savings benefits are an acceptable way to generate the ability to pay for what would otherwise be unaffordable.

6.2.2 To DoD Contractors. The objective of the DoD VE program is to motivate the defense contractor to practice VE and to activate the VE provisions in their contracts by submitting VECPs. The primary incentive is the money they receive from a share of the cost savings resulting from the approved changes to

their contracts and subcontracts.

Additionally, a VE program can enhance a contractor's competitive position and profit by:

- (1) Pre-contract VE application
- (2) VE as a factor in source selection
- (3) VE successes included in contract-performance evaluation
- 4) Improved negotiated fee or profit on new contracts due to past VE performance
- (5) Subcontractor VE application

6.3 Types of VE Provisions in DoD Contracts

The FAR, Parts 48 and 52, establish policy and procedures for the program or buying office to define the VE arrangements in a particular contract or on a specific acquisition program. Basically, there are two VE alternatives: an incentive approach in which the contractor participates in the VE program voluntarily, and a mandatory approach where the Government requires and pays for a specific level of VE effort. FAR Section 52.248-1 describes clauses for use in hardware systems and FAR Sections 52.248-2 and -3 describe clauses for use in architect-engineer and construction contracts respectively. Appendix D includes FAR Part 48 and 52.

6.3.1 Value Engineering Incentive Clause (VEIC). The basic VEIC is used in supply and service contracts and subcontracts with a value of \$100,000, or more. The VEIC may be included in supply or service contracts of lesser value if the contracting officer determines there is a potential for significant savings. Exceptions to this policy include contracts for: research and development (other than Engineering, Manufacturing Development,) engineering services from not-for-profit organizations, personal services, product or component improvement (unless the VE clause application is restricted to areas not covered by the provisions for product or component improvement), standard commercial items that do not involve any special requirements or specifications, or when the procuring agency has exempted the contract from this clause.

The VEIC provisions of a contract do not obligate the contractor to take any action. The VEIC is intended to encourage the contractor to take part voluntarily by sharing cost savings with the Government from VECs which the contractor developed on its own initiative.

The FAR provides for payment of the costs of preparing a VEC, if it is accepted and the contractor and the Government share in the savings resulting from implemented VECs. Development costs related to unsuccessful VECs are generally not allowed in accordance with the cost allowable principles of the FAR.

6.3.2 Value Engineering Program Requirement Clause (VEPRC). The FAR provides an alternate provision that allows the contracting officer to incorporate into a contract a clause which requires mandatory VE activity known as the VEPRC. Benefits are expected not only from the submission of VECs, but also from a continuous VE effort by the contractor in order to get results earlier. Thus, drawings, specifications, methods, and processes will reflect the full benefit of VE in the initial stages of design, development, and production. The sharing arrangements for approved VECs originated under VEPRC are less for the contractor than the share provided for VECs submitted under the VEIC.

The contracting officer may incorporate both the VEIC and VEPRC into the same contract. The VEPRC would be restricted in the contract schedule to specifically defined performance areas, while the basic VEIC clause is used to cover the remaining areas of the contract.

The VEPRC is a separately priced line item in the contract that specifies a certain level of VE activity and the portion (or portions) of the contract work to which it applies. Under the contract line item, four contract subline items are established:

(1) Contract subline Item 1. - is established for pricing (usually a firm fixed price) all contractual efforts exclusive of those required to conduct Government approved VE studied and implement Government approved VECs.

(2) Contract Subline Item 2. - is established for pricing (usually a firm fixed price for each approved VE study) all contractual efforts applicable to conducting Government approved VE studies.

(3) Contract Subline Item 3. - is established for pricing (usually a firm fixed price for each approved VEC) all contractual efforts applicable to implementing Government approved VECs.

(4) Contract Subline Item 4. - is established for paying (usually separate payment for each approved VEC) the contractor's share of savings resulting from the implementation of Government approved VECs.

The contract typically contains specific data requirements a contractor must provide for the Government to monitor and assess his VE program. The data requirements are detailed in the Data Item Descriptions (DIDs) DI-MISC- 81258A "Value Engineering Program Plan", DI-MISC-81259A,"Value Engineering Study Proposal", and DI-MISC-81260A, "Value Engineering Program Status Report" included in the Contract Data Requirements List (DD Form 1423).

Subsequent to contract award, the contractor is expected to accomplish those contractual efforts necessary to plan, establish, and conduct an effective VE program under the VEPRC. The contractor is expected to:

(1) Establish a VE program goal based on maximizing Government savings. As an initial VE program goal, the contractor's VE program shall be predicated on obtaining instant contract savings of 10 percent or more and collateral savings of 3 percent or more of the initial contract price.

(2) Develop and document a VE program plan for establishing and conducting an effective VE program. The contractor's VE plan should describe the contractor's organization, including the names of the individuals trained and competent in the principles, applications, and contractual aspects of VE selected to be the VE program manager, team members and instructors; a program structure to ensure that VE program requirements are adequately interfaced and integrated into all aspects (i.e., quality assurance, reliability, design, test, material selection) of the contractual performance; specific processes and procedures (i.e., identification and selection of the most promising areas for VE studies, establishment of cost reduction goals, identification and development of proposed VE studies, conducting and evaluating VE studies, selection and training of participating suppliers, determining savings, submission of VECs, implementation of approved VECs) for achieving an effective VE program; the level of contractual effort including an estimated cost and man-years separated into appropriate personnel skill categories (i.e., analyst, engineer, manager, computer programmer) disciplines

(i.e., quality assurance, engineering, testing, manufacturing, drafting), materials (i.e., raw, parts, equipment) and suppliers support; funding requirements; and training of contractor and suppliers personnel associated with the contract.

(3) Prepare a VE program status report, unless specifically not required by the contract or the contracting officer during the course of the contract, delineating the overall status of the VE program including potential, proposed, on-going, and completed VE studies and VECs. The report should be detailed to enable the Government to evaluate and determine the complete status of the VE program.

The report should include a record of the proceedings of each meeting and review which have the potential to impact the VE program (i.e., Design reviews, critical design reviews, in-process reviews, configuration management reviews, producibility program reviews).

(4) Prepare VE study proposals when the need for a VE study is identified based on potential Government savings at acceptable cost and risk. The VE study proposal should include an identification of the study item, including status (i.e., developed, manufactured, tested, etc.), scope of the study, study objectives, study costs and schedule, and recommendations.

6.4 What Is a VEC ?

A VEC is a proposal submitted by a contractor to the Government in accordance with the VE provisions of the contract. It proposes a change which, if accepted and implemented, provides an overall cost savings to the U.S. Government. The VE provisions in a contract permit the contractor to share in the savings which accrue from implementing the change. The VEC becomes a management tool to lower defense costs while increasing the contractor's rate of return on investment. This definition includes VECs which would produce collateral savings in Government Furnished Property (GFP), operations, maintenance, or other areas and which exceed any increased acquisition cost.

In order to qualify as a VEC so that savings can be shared, the proposed change must meet the two primary requirements stated in paragraph 6.1, without impairing essential functions or characteristics, provided that it is not solely based on a change: in deliverable quantities; in Research and Development (R&D) quantities or R&D test quantities due to results of previous testing under the instant contract; or to the contract type.

6.5 Sharing VEC Savings

There are two basic types of savings that can be shared when a VEC is approved and implemented. They are acquisition and collateral savings.

6.5.1 Acquisition Savings. The sharing rates (Government/contractor) for acquisition savings for supplies and services are based on the type of contract, the VE clause, and the type of savings, as shown in Part 52, Solicitation Provisions and Contract Clauses, of the FAR. For incentive contracts, sharing is the same as the contractor's profit or fee adjustment formula.

Acquisition savings include savings from the instant contract, concurrent contracts, and future contracts. The VEC is submitted under the instant contract. If the VEC is accepted and implemented on items delivered on the instant contract, the contractor receives a percentage of the net savings that accrue as a result of the VEC. In calculating these savings, contractor costs of developing and implementing the VEC and the Government's cost of implementation are all subtracted from the gross savings before sharing begins. Therefore, it is important that the contractor identify and record (for audit purposes) the costs incurred in developing and implementing the VEC. Development costs are expenses incurred after it has

been determined that a VECP will be prepared and before the Government accepts the VECP. Implementation costs are expenses incurred to implement the change after the VECP has been approved. All development and implementation costs must be offset before any sharing of acquisition savings may occur.

Concurrent contracts are those current contracts awarded by the acquisition activity to the contractor or other contractors for essentially the same item. If the contracting office directs that the VECP be incorporated into concurrent contracts, the contractor originating the VECP will share in the net reduction in price on concurrent contracts. The contractor does not begin to share concurrent contract savings until all costs of developing and implementing the VECP are offset.

Future contracts are contracts for items incorporating the VECP that are awarded after the VECP is approved. Future contract savings are shared on all affected items scheduled for delivery within three years (provided no waivers or deviations are applicable to the affected VECP) after the first item that incorporates the VECP is accepted. These future contract savings may be shared in one of two ways. The first is through a series of payments made for the contractor's share of savings as future contracts are awarded. This method of sharing is referred to as the "royalty" method. The second, known as the "lump sum" method, the instant contract may provide that the contractor accept its share of future contract savings in one lump sum, based on the contracting officer's projection of the total number of units that will be delivered during the sharing period. Under both methods, the contractor's share of future contract savings is added to the instant contract price. The instant contract, therefore, cannot be closed out until all VECP savings awards to the contractor have been made.

For multi-year contracts that run for more than three years after the first item is accepted, the sharing period covers all items accepted before the originally scheduled contract completion date. If the VECP is submitted during the engineering development and low-rate-initial-production solicitations and contracts, future sharing is based on that quantity of units produced during the highest 36 consecutive months of anticipated production based on the Future-Year Defense Program (FYDP) or other planning documentation existing when the VECP is accepted.

The benefits of an implemented VECP are only rewarded under a VE clause if the benefits can not be rewarded under other incentives of the contract. Thus, when performance, design-to-cost, or similar targets are set and incentivized, the targets of such incentives affected by the VECP are not adjusted because of the acceptance of the VECP.

6.5.2 Collateral Savings. Collateral savings are measurable net reductions in costs of operation, maintenance, logistics support, or GFP when these savings are exclusive of acquisition savings but are the result of an implemented VECP. In some cases, a VECP may increase the acquisition cost of an item but result in larger collateral savings. For collateral savings, the contractor is entitled to 20 percent of the net savings that the purchasing office estimates will be realized during a typical one-year period. However, the contractor's share cannot exceed \$100,000 or the contract's firm-fixed-price, target price, target cost, or estimated cost at the time the VECP is accepted, whichever is greater. The amount of collateral savings is determined by the purchasing activity, and its determination is not subject to the "Disputes" clause of the contract. Collateral savings provisions are included in contracts whenever an opportunity may exist for savings. They are intended to focus the contractor's attention on benefits in addition to acquisition savings.

The collateral savings provision may be excluded from a contract at the discretion of the head of the contracting activity. This is done when it is anticipated that the cost of computing and tracking collateral savings is greater than the benefits to be derived. Collateral savings arrangements may be deleted from

contracts for supplies and services as well as construction contracts.

6.6 VECF Preparation

6.6.1 Basic Requirements. Once the contractor has made the decision to submit a VECF, it should be noted that the likelihood of the VE change proposal being approved is proportional to the care taken in preparation. Sufficient information must be presented so that a reasonable evaluation can be conducted by the Government with minimum delay. Failure to provide adequate data will result in requests for additional information, or a rejection of the VECF. Preparation of a VECF should employ the same approach as taken in submitting a proposal in response to a procurement solicitation. The following is the FAR's description of the minimum information that the contractor must submit on a VECF:

(1) Change Proposal Description. A description of the difference between the existing contract requirement and the proposed requirements, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, the effect of the change on the end item's performance, and any pertinent objective test data.

(2) Contract Impact Analysis. A list and analysis of the contract requirements that must be changed if the VECF is accepted, including any suggested specification revisions.

(3) Change Proposal Unit Identification. Identification of the unit to which the VECF applies.

(4) Economic Analysis. A separate, detailed cost estimate for: (a) the affected portions of the existing contract requirement and (b) the VECF. The cost reduction associated with the VECF shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts.

(5) Government Implementation Cost Analysis. A description and estimate of costs the Government may incur in implementing the VECF, such as test and evaluation, and operating and support costs.

(6) Government Collateral Cost Analysis. A prediction of any effects the proposed change would have on collateral costs to the agency.

(7) Maximum Benefit Analysis. A statement of the time by which a contract modification accepting the VECF must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(8) Prior VECF Submission Identification. Identification of any previous submissions of the VECF, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

6.6.2 VECF Format. Although the FAR VE clause does not specify a format to be used in preparing a VECF, the Government Procurement Office may identify the appropriate format in the contract.

6.6.3 VECF Preparation Assistance. The contractor's primary point of contact is the cognizant Administrative Contracting Officer (ACO) located in the local Defense Contract Management Region (DCMR) office. Through the ACO, the contractor may obtain technical and administrative assistance concerning preparing and handling VECFs. Within each DCMR, there is a VE specialist and other engineers who are trained in VE practices and procedures. These trained technical people can advise the

contractor on all aspects of contractual VE. Also, assistance and information are available through the procuring agency and from its supporting technical agency. They can also be contacted through the ACO

6.7 VECF Transmittal Letter Requirements

Preparation of a transmittal letter forwarding the VECF to the Procurement Contracting Officer (PCO) and the ACO is also a very important step toward achieving success in contractual VE. The transmittal letter should state that the VECF is being submitted pursuant to the VE provisions of the contract. Also, the transmittal letter should serve as a summary of the contents of a VECF and it should briefly state the estimated price changes and nature of the proposed change, with references to details in the proposal. The transmittal letter serves both as a "Table of Contents" of the proposal and as a marketing document which brings out the "highlights" of the proposal, both in the area of technical advantage, and in the area of overall cost reduction to the Government. It is suggested that the form in Appendix C be utilized in conjunction with the transmittal letter to assure all data aspects have been included. The contractor shall submit VECFs to the PCO unless the contract states otherwise. If the contract is administered by other than the contracting office, the contractor shall submit a copy of the VE change proposal simultaneously to the PCO and to the ACO. It is extremely important that the ACO receive a copy of each VECF as the ACO is responsible for periodic follow-up with the PCO on all VECFs during the evaluation and to support the decision process by the PCO and other organizations involved in this process.

6.7.1 Proprietary Information Statement. If the VECF contains information that should be considered proprietary prior to Government approval, the contractor should include an appropriate legend on each page or sheet of the VE change proposal. The FAR language (Appendix D) for this legend is:

"These data furnished under the VE clause of Contract No. . . . , shall not be disclosed outside the Government or duplicated, used or disclosed, in whole or in part, for any purpose other than to evaluate a VE change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the contractor or from another source without limitations."

If the VE change proposal is approved, the Government then has the right to use any and all data contained in the VECF and its supporting documents in accordance with the terms and conditions of the contract. If the VECF contains data which the contractor wishes to be considered proprietary, a statement to that effect must be included in the letter of transmittal and the proposal to include terms and condition for license/data rights consistent with the basic contract. Details should be given in the proposal and the contractor must take exception to the "data" clause of the FAR to the extent consistent with the proprietary statement in the proposal. The contractor must realize that a VECF which would result in a "sole source" condition for future acquisitions may not be as readily accepted as one which does not impose this restriction on sources.

6.8 The Preliminary VECF

A candidate, or preliminary VECF can be used to submit an initial proposal to the Government before the submission of a formal VECF. However, this does not protect the originator if another contractor submits a formal VECF with the same engineering change.

Use of a candidate VECF is appropriate when the development of the formal VECF would require a contractor to risk significant funds. The contractor may use the candidate VECF to notify the PCO of the initial proposal, provide information concerning the potential for cost reduction, indicate the approximate

costs for developing the VECP and the estimated savings that might be achieved, and provide an early assessment of advantages and disadvantages.

The PCO typically coordinates a candidate VECP with the Engineering Support Activity (ESA) and the Value Engineering Office (VEO) for an initial evaluation to ensure that the proposal has merit and deserves to be developed into a formal VECP submission. This results in discussions between the Government and the contractor in order to reach an understanding. The PCO then indicates whether the idea deserves additional study, or should not be pursued any further due to circumstances known to the Government. The contractor should be aware that an indication from the PCO that the idea has potential, does not guarantee primacy of thought or origination or that the final VECP submission will be accepted. As with any VECP, there is still the possibility that it might be rejected, and there is some risk involved. The idea behind the candidate VECP is to reduce this risk so that the contractor does not expend significant funds on ideas that have little or no chance of being accepted.

Use of the candidate VECP carries with it some risk in multiple source situations. A contractor would have to weigh the risk of inadvertent disclosure to a competitor and the risk of investing time and money for a VECP that is of little or no interest to its customer versus the benefits to be realized by its acceptance. In submitting a candidate VECP, the contractor may include the data restriction language to protect proprietary information.

6.9 Government Response

The acceptability of a contractor's VECP is dependent upon the knowledge, insight, and care applied during its preparation and processing. The Government owes the contractor fair, timely, and objective evaluation of VECPs.

A response to the contractor is due within 45 days. If it is not possible to evaluate and reach a decision by that time, the PCO shall notify the contractor of the status of the VECP within 45 calendar days after it is received by the contracting office. The contractor shall be provided the reason for the delay, and be advised of the expected date of the contracting officer's decision. VECPs will be processed expeditiously. However, the Government assumes no liability for delay in acting on them.

The PCO shall accept the VECP by modification to the contract. If the VECP is not accepted, the contracting officer shall inform the contractor in writing explaining the reasons for rejection. The contractor may withdraw, in whole or in part, any VECP not accepted by the Government within the period specified in the VECP. The decision whether or not to accept a VECP rests solely with the PCO and may not be disputed by the contractor.

6.10 VECP Settlement

6.10.1 VECP Implementation. After the approved VECP has been implemented, the contractor is required to submit a new cost proposal reflecting any changes that may have occurred since the VECP was submitted. The update should address the following:

(1) Incorporation Point. This is the date that the first item incorporating the approved VECP was accepted by the Government.

(2) Cost Data. New information gathered from the implementation should be utilized.

(3) Quantity Affected. This is the number of items produced by the contractor on instant or concurrent contracts which incorporate the VECP.

(4) Changes. Any changes or conditions made by the Government or contractor; e.g. the VECP may be approved by the Government with modification.

(5) Variances/Rates. The unit price before and after the VECP implementation should be listed together with any other changes in costs or quantities.

This data must be supported by hard evidence wherever possible; e.g., purchase orders, quotations, actual prices, price history and, when these documents are not available, estimates based on good judgment factors should be provided.

The updated cost proposal should then be submitted to the Government Procurement Office (GPO) through the DCMR with all the backup data. At this point, the contractor can significantly enhance the claim by factual backup to the cost data. Upon completion of Government review, the parties will then proceed to negotiate an agreement for incorporation into the contract. The form shown in Appendix E should be used to facilitate this process.

During the negotiation, particular emphasis should be focused on sharing elements (unit cost, sharing period, Government and contractor implementation costs), instant contract savings, concurrent contract savings, future contract savings, collateral savings, and the type of settlement.

Once the negotiation has been completed, the VECP is defined by a supplemental agreement to the instant contract. This supplemental agreement is very important as it will be the reference document during the life of the VECP. This agreement should state the following:

(1) Type of settlement.

(2) Government's share of the Instant Contract Savings.

(3) Contractor's share of the Instant Contract Savings.

(4) Government costs (those costs over and above normal administrative costs) for the evaluation and implementation of the VECP.

(5) Royalty shares during the royalty period.

(6) Royalty period.

(7) Collateral savings and contractor's share.

(8) Contract line item number for VE royalty and collateral payments.

6.10.2 Types of Settlements. It is important that the VECP be settled as soon after implementation as possible to ensure that accurate information is obtained and that knowledgeable personnel can participate in the negotiation. It is advisable to settle the VECP by the most advantageous administrative process. The

three ways of sharing the savings from implemented VECPs are no-cost payments, lump-sum payment, and royalty payments.

(1) No-Cost Settlements. This method applies when the amount of the savings does not appear to warrant the administrative expense of royalty settlement, and both the contractor and the government agree. Here, the contractor keeps all of the savings from implementing the VECP on his instant and concurrent contracts and the government retains the savings from future and other concurrent contracts. The government also keeps collateral savings.

(2) Lump-Sum Settlement. This method can provide instant, concurrent, future, and collateral savings with one contract modification. Hence, it provides early cash flow for the contractor and removes the risk of an adverse change in the FYDP. Such a settlement significantly reduces the administrative burden on both the government and contractor. However, any additional funds required must be available before the contract can be modified.

(3) Royalty Settlement. This method allows for payment of savings on the future contracts as they are awarded with deliveries scheduled within the three year sharing period provided no waivers or deviations are applicable to the affected VECP. This method is more exact than a lump sum payment, but it takes more time to settle. It is subject to subsequent adjustments, and it delays close-out of the instant contract. The government has additional time to arrange funding for the settlement. In this case, the contractor loses the advantage of early cash flow, but gets an opportunity for additional savings from more up-to-date information.

6.11 Subcontractor VE

Prime defense contractors are encouraged to extend VE provisions to their subcontractors. The FAR requires prime contractors to extend VE to their subcontractors on contracts of \$100,000 or greater; however, VE may be extended to subcontractors on contracts of lesser value. See Appendix D for current FAR reference.

Prime contractor-subcontractor VE arrangements can be made by the prime contractor extending to the subcontractor a percentage of the amount the prime contractor receives, including "instant" or current contract share, "collateral" share, and "future acquisition" share. For example, a subcontract might provide a 50 percent share of whatever dollar amount the prime might receive in the three areas of sharing on a successful VECP.

The sharing between prime contractor and subcontractor is a matter of negotiation but it should motivate the subcontractor to perform VE and to submit VECPs to the prime contractor. It should also provide a fair

share to the prime contractor who is responsible for the formal VECP submission to the Government. Any development and implementation costs accrued by the subcontractor and the share of instant contract savings extended to the subcontractor are considered to be part of the prime contractor's development and implementation costs. It should be noted that the agreements made between the prime contractor and the subcontractor are not permitted to reduce the Government's contractual share of savings.

A subcontractor must submit its VECP to the prime contractor who in turn submits it to the Government.

6.12 VECP Submission Without A Contract Provision

It is possible that a contractor has an idea for a VECP, but the contract does not contain VE provisions. In this case, there are two methods available to the contractor for submitting a VECP. The second method is the preferred.

(1) The contractor notifies the GPO of a pending VECP submission, and requests that a contract modification be issued as soon as possible incorporating the applicable FAR provisions. When the modification is issued, the VECP can then be submitted. This method is time consuming.

(2) The contractor prepares the VECP, or a preliminary VECP, and submits it to the Government Procurement Office. The transmittal letter should state that the applicable contract does not contain VE provisions, that the right to use the idea is contingent upon incorporation of the appropriate FAR VE provisions into the contract, and that if the idea is accepted, acceptance will be pursuant to the VE clause.

6.13 VECP Submission Without A Contract

Previously, the Armed Services Procurement Regulation (ASPR) 1-1708 made specific provisions for the submission of cost reduction proposals with regard to supplies or services for which the submitter did not have a current Government contract. These proposals were termed Unsolicited VECPs (UVECPs). However, Defense Procurement Circular No. 76-9, dated 30 August 1977, eliminated the use of UVECPs. Likewise, they are not permitted under the FAR.

The FAR does provide for unsolicited proposals, however, outside of the VE provisions. Section 4, Part 9, of the FAR states that it is the policy of the Government to foster and encourage the submission of unsolicited proposals. However, the FAR restricts unsolicited proposals to "unique or innovative methods or approaches which are proposed for the purpose of securing a contract for (a) research on or development of the methods, approaches, or ideas it contains, or (b) the conduct of the activity or services or the delivery of the items it proposes."

6.14 Contested VE Decisions

The courts have been reviewing cases and handing down appeal decisions since 1963. These decisions help to clarify the Federal regulations and must be taken into account in those areas where the actions are germane. These decisions are published regularly as "Armed Services Board of Contract Appeals Decisions," "Contract Cases Federal," "Comptroller General Board Cases," and "U.S. Court of Claims Decisions." They can be found through the publications of the Commerce Clearing House, 4025 W. Peterson Avenue, Chicago, IL 60646. "A Compendium of Contested Value Engineering Actions" is also available from the Electronics Industries Association, 2001 Eye Street, N.W., Washington, D.C. 20006.

6.15 Summary

DoD contracting officers are expected to encourage contractors to submit VECPs that reduce cost and to share the resulting savings as a reward for the effort undertaken by the contractor. The two types of VE contract clauses are: the VEIC which entitles the contractor to a share of the savings resulting from accepted proposals and the VEPR clause which requires the contractor to conduct a VE effort under the contract. This effort is a separately identified and funded contract line item. Both clauses can be incorporated into the same contract. Government and contractors share in acquisition savings according to the sharing rates specified in the individual contracts. Contractors share in Government collateral benefits

by receiving 20 percent of the net savings in a typical year.

The FAR requires VE provisions in subcontracts meeting certain dollar thresholds and establishes minimum information requirements for all VECP submissions. The FAR also requires protection of contractor VECP data rights and specifies a status response to the contractor within 45 days after PCO receipt.

CHAPTER 7

ESTABLISHMENT, OPERATION AND MANAGEMENT OF THE VE PROGRAM

7.1 AMC VE Strategic Planning

The AMC VE Community has developed a VE Vision Statement to conceptualize its role and a VE Mission Statement to articulate methodology to achieve that role.

7.1.1 Vision Statement. "Be a self-sustained, world-wide, recognized leader for improving utilization of resources by analyzing products, processes, and procedures, and developing alternatives through the use of VE/VA techniques in all phases of the Materiel Life Cycle."

7.1.2 Mission Statement. "To lead the Army in obtaining best value and quality products through the application of Value Analysis techniques in all phases of the materiel life cycle and to generate assets for enhancing readiness."

7.2 AMC VE Policy

7.2.1 General. The objective of the AMC VE Program is to obtain value improvement of Army system acquisition, operations, support, procedures, supplies and services by - reducing the overall cost; improving quality and schedule and simplifying Army materiel/systems to provide measurable improvements in operational availability and logistics support.

7.2.2 Policy. Procurement policies and practices applying to the VE Program are set forth in parts 48 and 52 of the FAR. AMC VE Program reporting organizations are required to:

(1) Establish VE programs and employ the VE methodology as set forth in DoD Handbook 4245.8H, where appropriate. The VE Program should be tailored to fit the missions performed (e.g., commodity, service, supply, or facility-oriented missions). The VE programs will also support VE policy issued by the Army Acquisition Executive for Program Executive Officers (PEOs) and Program Managers (PMs) who obtain functional support from AMC's Major Subordinate Commands (MSCs), installations, and activities.

(2) Report and accredits in-house VE efforts savings, VEPs, toward the savings goal when financial benefits are verified, i.e.,

(a) The study/analysis is documented as a planned VE effort prior to the preparation of any specific change proposal.

(b) The study/analysis itself is accomplished using a "functional analysis" (DoD Handbook 4245.8H) and documentation verifying this is included in the project file.

(3) Report on contractor VE efforts, VECs, with data reflecting technical decisions and appropriate contract modifications.

7.3 AMC VE Regulations

7.3.1 General. AMC Regulation 70-8 prescribes responsibilities, and general procedures for the planning,

management, review and assessment of activities for conducting the AMC VE Program. It implements the basic policies and concepts of FAR and OMB Circular A-131. This regulation applies to Headquarters, AMC; AMC MSCs, including their subordinate installations and activities; Army PEOs and PMs who obtain functional support from AMC's MSCs, installation, and activities. Its requirements encompass all Army systems, subsystems, items, and materiel undergoing development for which AMC is the materiel developer or for which AMC supports the materiel development. It also applies to materiel change programs; non-developmental items; facilities; and Army administrative, technical, and logistical operations.

7.3.2 Responsibilities.

(1) HQ AMC

(a) The HQ AMC Deputy Chief of Staff for Research, Development and Acquisition (AMCRDA).

- (1) Approve policy for the AMC VE Program.
- (2) Measure progress toward AMC Value Engineering Master Plan (VEMP) goals at the quarterly AMC Commander's Conference.
- (3) Designate a full-time VEPM to manage the AMC VE Program and to serve as the staff interface with HQ DA and DoD on all VE matters .
- (4) Establish and maintain contracting policy for support of the VE program
- (5) Disseminate decisions and appropriate guidance concerning all contested procurement settlements of VECs to all procurement activities under HQ AMC.
- (6) By 30 June, provide general guidance and objectives to the MSC Commanders and VEPMs in the areas of budget objectives, VE goals, strategies, training, staffing, contractual projects, and task team efforts. Accompanying the guidance document shall be a letter from the Commander of AMC requiring each MSC to submit formal VEMP in accordance with AMC guidance by 30 August.
- (7) Approve the AMC VEMP including the goals formulated by the MSCs.

(b) The HQ AMC Deputy Chief of Staff for Engineering, Housing, Environment, and Installation Logistics (AMCEN) will ensure that VE is used during the planning, design, construction, operation, and maintenance of facilities.

(2) The Industrial Engineering Activity (IEA)

- (a) Provide management of the AMC VE Program in accordance with AMC R 10-13.
- (b) Serve as the technical focal point for AMC VE reporting and supporting organizations.
- (c) Manage Value Engineering Management System (VEMS) and chair the VE Functional Coordinating Group (FCG). Conduct a minimum of two FCG meetings per year in conjunction with the spring SAVE International conference and the fall Electronics Industry Association (EIA) Value

Management Group (VMG) meeting.

(d) Monitor the availability and effectiveness of VE education and training within AMC and in the private sector.

(e) Conduct VE Staff Assistance Visits to VE reporting organizations/elements.

(f) Compile and publish quarterly AMC VE Program Execution Reports (RCS: AMCPD-306) and DA Statistical Summary of VE Activities semiannually not later than the first working day of the second month following the end of the second and fourth quarters of the fiscal year.

(g) Promote the practice of VE through contacts with industrial associations, professional societies, universities, and other Government agencies.

(h) Administer the VE Awards and Publicity Program.

(i) Prepare and maintain this regulation and implementing guidance.

(j) Consolidate the MSC VEMPs and calculate the AMC savings goal total by adding the Fiscal Year savings goal of each MSC. Provide the document to AMC by 30 September.

(k) Manage funding for the AMC VE Program.

(3) The Director of the AMC Logistics Support Activity (LOGSA) is responsible for performing the central system design agency role for the automated VE reporting functions of the AMC VE Program.

(a) Budget for, operate and maintain the VE database and the VE reporting system.

(b) Submit consolidated quarterly VE data to IEA, ATTN: AMXIB not later than ten working days following the end of the quarter.

(c) Provide training and documentation for VE reporting system.

(d) Provide ad hoc VE output reports to HQ AMC and IEA.

(e) Appoint a member to the FCG.

(4) Commanders of AMC Major Subordinate Commands

(a) Appoint and charter a full-time, high grade VEPM to manage the Command's VE Program.

(b) Prepare and update a Command VE Master Plan.

(c) Budget for the funds to operate and attain the goals of the VE Program.

(d) Provide functional support to PEOs/PMs in VE reporting actions such as preparation of VE master plans and quarterly progress reports.

(e) Assign a representative to the AMC VE FCG.

(f) Send VE reporting data utilizing VEMS on a regular basis to the LOGSA, for inclusion in the VEMS database. Send final data for the quarter not later than the close of business on the 5th working day following the end of the fiscal year quarter.

(g) Submit the annual VEMP and savings goal to the IEA VEPM.

(h) Ensure that appropriate personnel are trained in the Principles and Application of VE (PAVE) and Contractual Aspects of VE (CAVE).

(i) Establish procurement policies and practices applying to the VE Program as set forth in parts 48 and 52 of the FAR.

(5) VE Program reporting organizations

(a) Actively elicit VECs from contractors.

(b) Promote VE through contractor meetings and the dissemination of promotional and informational literature regarding the VE provisions of contracts.

(c) Observe the following guidelines and time limits for processing VECs:

(1) Acknowledge the VEC receipt by the contracting officer in accordance with the FAR and send a proposal evaluation/decision timetable to the submitting contractor within 45 days.

(2) When the VEC does not contain sufficient documentation to enable the government to evaluate the VEC, then within one week of receipt of the VEC return to the contractor as incomplete and request resubmission.

(3) Expedite financial settlement of approved VECs to meet the target date specified in the AMC VEMP. Use interim contract modifications to incorporate VECs so that savings are not lost while waiting for contract pricing, audits or negotiations to conclude.

(4) Record and justify delays when a technically approved VEC is not financially settled as specified in the AMC VEMP. Place this documentation in the project file.

(d) Use the VEIC provided in the FAR for facilitating the submission of VECs in supply or service contracts for spare parts and repair kits exceeding \$100,000.

(e) Incorporate the mandatory VEPRC provided in FAR paragraph 52-248.1 Alt 1 in all production contracts over \$10 million, except where Head of Contracting Activity (HCA) determines and documents that such use is not appropriate.

(6) PEOs and PMs who obtain functional support from AMC MSCs/installations/activities

(a) Appoint a VE Project Officer/Point of Contact to manage and coordinate assigned VE functions.

- (b) Program, budget, and allocate funds to support VE efforts.
- (c) Prepare and approve a VE Master Plan.
- (d) Establish and maintain contracting policy for support of the VE Program.

7.3.3 Verification of VEP Savings.

- (1) VEP savings are reported and accredited to the savings goal after being verified by the appropriate funding certification official.
- (2) The verification attests that saved funds are/were on hand, or were formally budgeted for and are no longer required for the originally intended purpose, and have been made available for other appropriate uses. This verification will be documented in the project file.

7.3.4 Reporting.

- (1) By 30 June, AMC will provide guidance to the MSC's to give general direction and objectives, VE goals, strategies, training, staffing, contractual projects, and task team efforts. This guidance shall be used by the MSC's in developing the MSC VEMP for the following FY. Accompanying the guidance document shall be a letter from the Commander of AMC requiring each MSC to submit a formal VEMP in accordance with AMC guidance by 30 August.
- (2) The MSC VEMP should contain VE goals developed by the individual MSCs and supported PEO/PM activities. The plan should describe the specific methods for achieving the objectives listed in the AMC Master Plan Guidance and should address continuous improvement in the areas of budget objectives, VE goals, strategies, training, staffing, contractual projects, and task team efforts. Each MSC should submit a final MSC VEMP to IEA.
- (3) IEA will consolidate the VEMPs from each MSC and compute the sum of all MSC/PEO savings goals for a total AMC savings goal. A copy will be provided to HQAMC by 30 September.
- (4) AMC will approve the savings goals for each MSC. The final AMC VEMP shall consist of the AMC guidance section and master plans from each MSC.
- (5) IEA will review and consolidate the summary data with other information to publish the AMC VE Program Execution Report (RCS:AMCPD-306) and the DA Statistical Summary of VE Activities. These reports will be published semiannually not later than the first working day of the second month following the end of the second and fourth quarters of the fiscal year.

7.3.5 VE Staff Assistance Visits. Conducted by teams led by the IEA VEPM, VE Staff Assistance Visits (VESAVs) substantiate the accuracy of reported VE savings, assess overall VE program management, evaluate compliance with AMC VE Program guidance and identify potential improvements for the VE Program. Usually, one visit per year is performed at each reporting MSC.

7.3.6 Awards. Public recognition of significant VE achievements by individuals, groups, or organizations sustains and strengthens in-house and contractor participation in the Army VE Program.

- (1) Monetary awards. Each VE reporting element should administer an in-house awards program in

accordance with AR 672-20 and AR 5-17. Individuals or groups who submitted and/or developed ideas which were implemented as a VEP will be considered for a monetary award.

(2) Honorary awards. Each VE reporting element supports the honorary awards program administered by HQ AMC and contributes nominations for DoD as well as AMC Honorary VE Achievement Awards. Individuals, Army organizations, and contractors are eligible.

7.3.7 Publicity.

(1) IEA publicizes AMC VE Program accomplishments by publishing an annual brochure describing outstanding project achievements, ingenuity and applicability; exhibiting VE results at appropriate conferences or Government/Industry meetings; and preparing handouts, posters and other publicity information to foster participation.

(2) Each MSC assists in meeting AMC publicity needs by providing objective VE project data and camera-ready graphics to IEA or its designated representative. Each MSC publicizes VE throughout its own organizational structure as it sees fit.

7.4 **Processing VE Proposals**

7.4.1 Proposal Format and Content.

(1) VECP Format and Contract. Contractors should use DD Form 1692, Engineering Change Proposal (ECP), for submitting VECPs and should include the information specified in Paragraph 6.6, Chapter 6.

(2) VEP Format and Content. VEP format is not rigidly defined except in cases where a Configuration Item is changed. In these cases, completion of DD Form 1692, ECP, is required. Regardless of format, sufficient information must be included in the VEP to permit an objective evaluation within a reasonable time. As a minimum, the VEP should describe in detail the condition before and after the change, documents requiring change, cost savings, development and implementation costs including testing and operating and support costs, a recommendation of optimum implementation time, and an implementation plan.

7.4.2 Document Flow (See Fig 7-1).

(1) Contractor. Contractors should submit the number of VECP copies prescribed by the contract. The original copy should be addressed to the PCO unless stated otherwise in the contract.

(2) Procuring Contracting Officer (PCO).

(a) The PCO reviews the incoming VECP and provides a copy for the project engineer to use for the technical approval phase. The PCO determines the applicable quantity and pricing data for the instant and concurrent contracts.

(b) The PCO requests assistance from a price analyst in determining the amount of savings that may be realized. It is important for the price analyst to begin this work during the technical evaluation phase and to continuously coordinate with the technical activity and/or the cost analyst.

(c) The PCO determines the availability of funding for executing a contract modification of the instant contract to implement the VECP. For contract modifications, the PCO may need funds for implementing the VECP. He/she may need funds later for sharing the savings on future contracts and for collateral savings.

(d) Once he/she has the decision of the configuration manager, the contracting officer prepares the response to the contractor. If the VECP is approved, an implementing contract modification should be prepared providing funds are available.

(e) Throughout the processing for technical approval and financial settlement, the PCO maintains a log of action taken on the VECP.

(3) Technical Data Control Center (TDCC)(or Equivalent Office). This office enters the VECP/VEP into the control system for engineering change proposals and sends a copy to the Configuration Manager (CM). The office also assigns and/or records a VECP/VEP control number, which is used for tracking the VECP/VEP through the processing cycle. This control number is entered into VE reporting system.

(4) Configuration Manager/Configuration Management Office (CM/CMO).

(a) Upon receipt, the CM/CMO reviews the VECP for accuracy, completeness, and content. If the CM deems that a proposal is acceptable, he/she makes arrangements for a configuration control board meeting. With the correspondence that announces the meeting, the CM sends copies for review by the members of the configuration control and cost analysis office, and informs the contracting officer and the VEPM that processing is underway.

(b) If the CM deems that a proposal is unacceptable, he/she forwards it to the contracting officer and provides reasons why it was not acceptable. The CM also indicates what must be done for the proposal to be acceptable.

(c) A CM is officially designated for each weapon system. Since the level of decision making is based on the value of a proposal, a CM may need to get final approval of his/her Command Group. After approval, the configuration manager provides a written notice of the decision to the contracting officer and furnishes a copy of that correspondence to the VEPM and CCB members.

(5) Value Engineering Program Manager (VEPM). The VEPM continues to monitor VECP progress up to the time of financial settlement. He/she tracks both the status and dollar value of the VECP. He/she also reports results through VE reporting system, at local Reviews and Analysis, and at quarterly VEPM program meetings.

(6) Cost Analysis Office. This office reviews the cost estimates provided with the VECP. The cost analyst checks the arithmetic accuracy of the data, tests the rationale of the estimate, compares the quantity and cost data of the estimate with those of the contract, and with future year quantity data with the FYDP. If the data and logic are correct, he/she validates the cost estimate. Ideally, the cost analyst will complete the review for validation in time to support the configuration control board.

(7) Price Analysis Office. This office reviews the proposal in terms of sharing base, investment costs of contractor and government, instant, concurrent, and future contract savings; and collateral costs. The price analyst checks the arithmetic accuracy of the data, tests the rationale of the estimate, compares the quantity and cost data of the estimate with those of the contracts. If the price and quantity data are accurate,

he verifies the financial settlement data.

(8) Configuration Control Board (CCB).

(a) This board will be chaired by the CM or his/her designated representative, depending on the level of the Board (Level I, II or III). It should include members from all of the organizations that will be directly affected by the engineering change. Typically, there are members from engineering offices, as well as maintenance, material management, production, quality assurance, and safety. The purpose of this board is to recommend approval or disapproval. After the decision, the VECP is sent back to the project engineer. If the board recommended approval, the project engineer sends the VECP to the CM (other than for a Level I CCB which he/she chairs) for final review and approval/disapproval.

(b) If the board recommends disapproval, the project engineer must take further action. If additional information or editing could result in approval, he/she schedules a follow-on board meeting to consider the additional data. Otherwise, he/she forwards the VECP to the contracting officer with a suggestion to rework specific areas or to discontinue action on the proposal.

(c) If the proposal has technical merit but significant risk, the board may recommend additional testing. When the test is conducted and the results are evaluated, the proposal is reconsidered by the board.

7.4.3 Process Delays. If the proposal was approved but the pricing data are inadequate, the project is deactivated in terms of the control system and additional data are requested from the contractor. When the appropriate data are provided by the contractor, the proposal is reactivated and processing for financial settlement resumes. Although deactivation and reactivation are possible, it's best to have proper pricing data early so that technical approval and financial settlement can proceed continuously.

7.4.4 Procedures Peculiar to VEPs.

(1) Identification. The study/analysis must be identified as a planned VE effort and documented, using the Informal Memorandum (See Figure 7-2), prior to the presentation of any specific change proposal. (The completed Informal Memorandum must be included in the project file.)

(2) Function Analysis. The study/analysis must be accomplished using "function analysis" and documentation must be included in the project file. Evidence of cost comparisons and evaluation of worth should also be included in the proposal documentation package.

(3) Savings Documentation. The VEP savings will be reported and credited toward the goal when verified by the appropriate funding Certification Official (See Figure 7-3). This verification will be that the "hard dollar" savings funds are on hand, are no longer required for the originally intended purpose, and have been made available for other use. Because of the nature of revolving funds (e.g., Army Industrial Fund, Conventional Ammunition Working Capital Fund) it is not always possible to specifically identify the reprogrammed usage of the savings dollars.

7.5 Reporting VE Accomplishments

7.5.1 Responsibility.

(1) Value Engineering Participants. PEOs, PM, and heads of functional directorates are responsible for providing original data about their programs to the VEPs of MSCs.

(2) MSCs. MSCs are responsible for collecting VE data, editing and compiling it, and entering it into VE reporting system.

(3) LOGSA. This activity maintains a value engineering data base and provides periodic and ad hoc reports for DOD, DA, and AMC organizations.

7.5.2 Reporting System. Except for original hard copy development, there is no system for collecting data within MSCs. MSC VE offices will report into the VE reporting system at LOGSA in Huntsville, Al. The means of data transfer include Defense Data Network (DDN), electronic mail, or Defense Switching Network (DSN).

7.5.3 Reporting Frequency. The VEPMs are encouraged to report data monthly, if there is any activity. If not the VE office is responsible to advise LOGSA of the status quo. At the end of each quarter of the FY, LOGSA will compile the most recent VE data and transmit the data to IEA, who publishes the AMC Quarterly VE Execution Reports of VE progress within AMC. Periodic VE reports are made to HQ DA, as required.

7.5.4 Progress Status Data. VE reporting system tracks progress of value engineering projects in terms of eight specific events:

(1) Receipt. This is the date when a contracting officer receives a VECP or a VEPM receives a VEP from a government element.

(2) Approval. This is the date when a configuration manager or other authority approves a value engineering proposal.

(3) Disapproval. This is the date when a configuration manager or other authority disapproves a value engineering proposal.

(4) Implemented. This is the date at which the VECP takes effect. This is also the date at which a production process integrates the VECP. It is not necessarily the date at which the government begins to accept items that were affected by a VECP.

(5) Settlement. This is the date when a contracting officer modifies a contract to settle a VECP or when a government financial officer changes a Procurement Request Order Number (PRON) to implement or distribute savings from a VEP.

(6) Withdrawal. This is the date when a contractor unilaterally withdraws a VECP from further consideration by the government.

(7) Deactivation. This is the date when government processing stops and a VECP is returned to a contractor for further action.

(8) Reactivation. This is the date when a reworked VECP is received by the government after which further processing resumes.

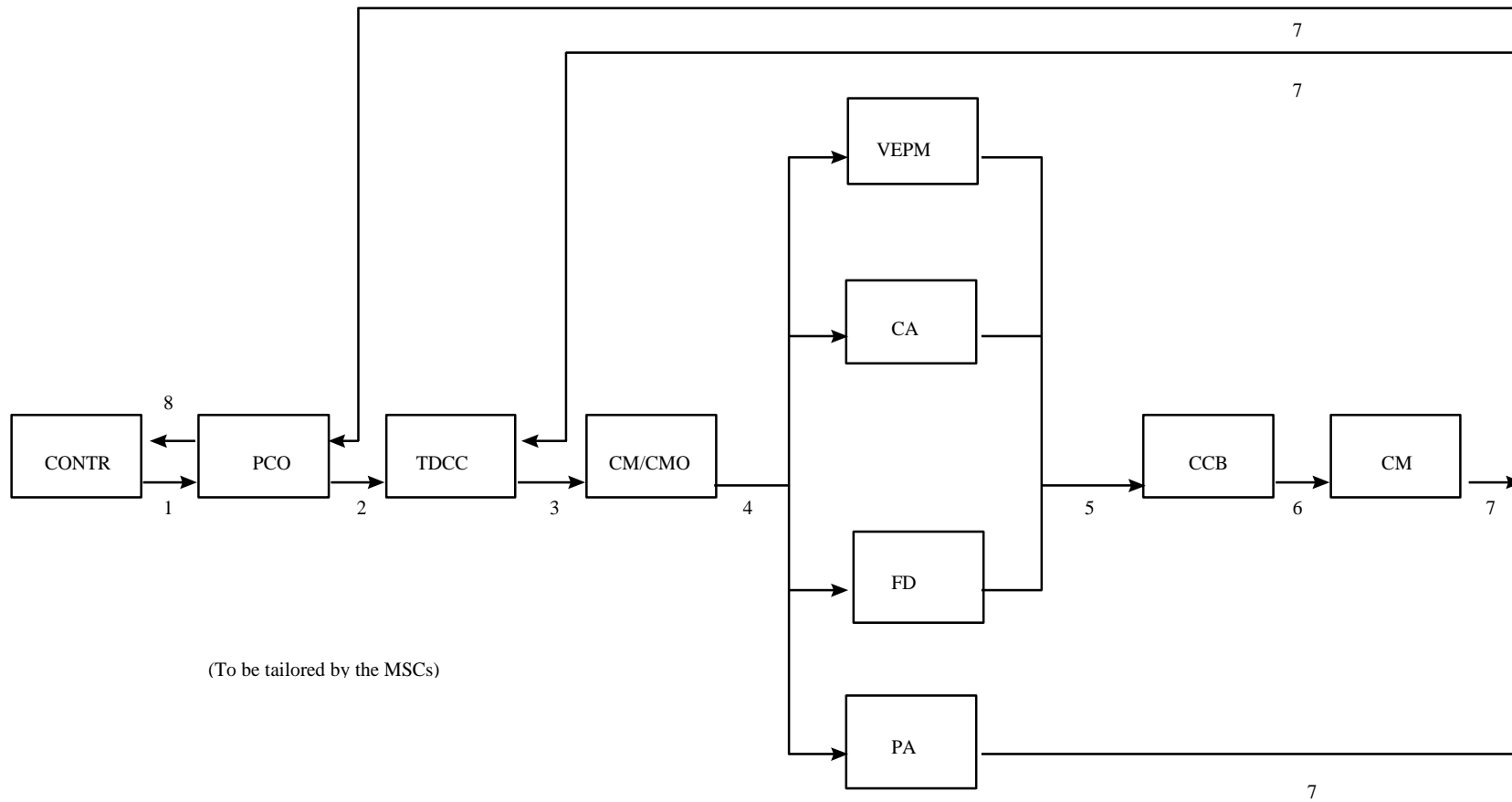


Figure 7-1. General Document Flow for Technical Approval

MEMORANDUM FOR VE Program Manager

SUBJECT: Identification of Value Engineering (VE) Effort

1. This Informal Memorandum is to identify a planned VE study/analysis.

2. A study/analysis effort is planned for:

3. The study/analysis effort will include a function analysis and be documented as a VE effort for reporting purposes within the VE program. This effort is planned to be conducted in the following manner:

4. Point of contact for this effort is _____

*NOTE: This Informal Memorandum may be used as notification/identification to or from the VE Office.

(Supervisory Level)

OFFICE SYMBOL (5-4e)

Figure 7-2

MEMORANDUM FOR XXXXX

SUBJECT: Verification of Value Engineering (VE) Savings

1. VE action number _____ with stated current year savings of _____ and estimated program budget savings of _____ has been reviewed for accuracy of current year savings.
2. The undersigned verifies:
 - a. That funding in the amount of \$ _____ in FY ____ funds was available for accomplishment of the action/activity identified to be changed by the VE action.
 - b. That \$ _____ in FY ____ funds are no longer required as a result of the VE action.
 - c. That this \$ _____ in FY ____ has been/will be applied to

Type of Funds _____

Program Element Number _____

Activity Account Level Number _____

(Fund Reprogramming Authority
Level)

Figure 7-3

VEPMs provide other data about each value engineering proposal, such as: contractor, contract number, office symbol, savings (amount, sharing ratio, fiscal year), title, and weapon system (to which the proposal relates).

7.6 Summary

The objective of the AMC VE Program is to simultaneously: improve quality and schedule; reduce overall cost; and simplify Army materiel/systems to provide measurable improvements in operational availability and logistics support. Through the use of VE methodology, better and more economical means of doing business are investigated, identified, and implemented. AMC organizations should establish VE programs and tailor them to their assigned missions whether commodity, service, supply, or facility oriented.

The procurement policies and practices applying to the VE Program are set forth in Parts 48 and 52 of the FAR. AMC Regulation 70-8 implements the basic policies in the FAR. It prescribes responsibilities, and general procedures for the planning, management, review, reporting, and assessment of activities for conducting the AMC VE Program.

CHAPTER 8

TRAINING

8.1 Introduction

Training is the most important element of a comprehensive VE program. Continual emphasis must be placed on training if VE is to reach its full potential. An overall program, to include both formal and informal training, should be set up for top management, operational management, operating personnel and value engineers.

8.2 Establishing a VE Training Program

A VE training program serves to demonstrate a management interest in the development of additional skills by its employees. Decisions regarding the type or method of training and identifying those personnel who are to be trained will depend upon the size and scope of the organization. In establishing a VE training program, there are three important elements that must be initially formulated:

8.2.1 Training Responsibilities. Because a VE training program will require participation by many organization elements, coordination by a central source is desirable in order to avoid conflict, duplication, and dilution of the primary effort.

8.2.2 Training Plan. Normally prepared under guidelines of the overall VE Program plan, a training plan should be developed to include annual training schedules, procedures for assessing the effectiveness of the training provided, and a method for developing in-house training capabilities (if none exists and the organization warrants it).

8.2.3 Training Capability Development. The establishment of in-house training capabilities reflects the need of the organization. Where no VE program exists, an in-house training capability may be achieved by obtaining VE training outside the organization. Courses such as "Principles and Application of Value Engineering" and "Contractual Aspects of Value Engineering" are available to qualified DoD personnel. These courses are offered periodically by the Army Management Engineering Training Agency at Rock Island, IL and the Air Force Institute of Technology (AFIT) at Wright Patterson Air Force Base, Ohio. Some other sources of VE training available are:

- (1) Consulting organization with VE training capability.
- (2) Professional societies such as the SAVE International.
- (3) Colleges and universities such as UCLA, Northeastern University, Boston University, and the University of Wisconsin, etc.
- (4) Special VE workshop in construction conducted by the Army Corps of Engineers.

8.3 Types of VE Training

8.3.1 Workshop Seminar. Workshop seminars are the main source of formal VE training for operating personnel. These seminars provide an opportunity for an individual to sample value work before being committed to it.

(1) Duration and session schedule. A 40 hour workshop seminar is common. The time is normally divided into equal hours of lecture and project work.

(2) Participants. The size of the class will vary according to the organizational needs and the availability of experienced personnel to serve as team project leaders. Experience has shown the best class size to be about 30 students, but satisfactory results have been achieved with larger groups. Students should normally be drawn from various line and staff groups such as engineering, purchasing, manufacturing, reliability, finance, quality assurance, etc.

(3) Curriculum. The seminar lecture schedule, prepared in advance, should include a curriculum covering all aspects of the VE methodology. Workshop projects are an essential part of the workshop seminar. Basically, students working in teams apply the VE methodology to something of questionable value. Projects should be selected in advance and should offer students an opportunity to realize actual savings. Students should be provided with a sample data package of general and specific guidance in order to evaluate the project and recommend changes. Figure 8-1 details a sample data package.

(4) Team organization and responsibility. Teams should consist of three to five students for the project portion. Each team will be responsible for preparing a report describing application of the lecture theory to the workshop project. Workshop seminars may conclude with oral presentation by team members to management detailing the findings and recommendations resulting from their project.

(5) Vendors. Vendors should also be included in workshop seminars to provide information on new ideas and innovations in production, materials, or processes relative to the projects. To be of maximum use to the students, vendors should be planned for and scheduled as soon as the projects are selected.

8.3.2 Orientation Sessions. This type of VE training is normally conducted by staff value engineers and generally runs 1 to 8 hours duration to introduce the fundamentals, goals, and operation of the VE program. These sessions are appropriate for personnel whose primary responsibility does not warrant attendance at a full-scale workshop seminar, such as managers, executives, senior staff personnel, planning personnel, draftsman, technicians, and newly hired personnel. Although the specific content of orientation/instruction lectures must be tailored to the needs of the individual activity, they generally should include most of the following topics:

- (1) Objectives of the VE program.
- (2) Concepts of value.
- (3) Principles of VE methods.
- (4) Criteria for applying VE.
- (5) Organization and operation of the VE program.
- (6) Contractual aspect of VE.
- (7) Case histories.

<i>Drawings, Layouts or Sketches</i>	<i>Design Criteria and Status</i>
Next Assembly	Intended Function
Assembly	Weight
Detail Parts	Reliability
Schematics	Known Problem Areas
	Design History
<i>Cost (Actual and/or Anticipated)</i>	Fabrication History
Tooling	Procurement History
Raw Material	Associated Documentation
Outside Purchased Parts, Tooling	Manuals
Inspection	Handbooks
Fabrication	Reports
Assembly	
<i>Manufacturing Planning and Status</i>	<i>Contract Data</i>
Tooling Description	Incentives
Handling Equipment	Quantity Required
Planning Sheets	Anticipated Future Quantity
Scrap Loss	
Lot Size	<i>Purchasing Data</i>
Packaging and Shipping	Responsible Buyer
	Participating Vendors
<i>Contact Points (Name, Location, Telephone)</i>	<i>Photographs</i>
Responsible Designer	
Responsible Buyer	
Responsible Cost Analyst	
Responsible Contract Administrator	
Specialty Consultants	
Theory	
Fabrication	
Quality	
Field Services	
<i>Specifications (Performance, Model, Process)</i>	
Customer	
Internal	
Subcontractor	

This is not intended as an exhaustive listing of important considerations, but is intended to serve as a guide.

Figure 8-1. Data Package for Workshop Projects

8.3.3 Informal VE Training. Some organizations may chose to train personnel in VE through less formal methods or to supplement other programs with informal training devices. Some of these informal training approaches are:

- (1) Handbooks and manuals can both be used as a means of bringing about a climate of cost awareness throughout an organization. Manuals can be used to demonstrate how to perform VE, while handbooks can provide cost data.
- (2) Bulletins and newsletters, distributed periodically, can contain a section devoted to VE methodology, thereby acting as continuing reminders of the need for better value.
- (3) Technical meetings at which VE films or speakers from other activities can be presented. These can be very effective approaches to use in orientations and indoctrination sessions of top management.
- (4) Displays of successful VE case histories can be placed on bulletin boards and other appropriate locations throughout an organization.

8.4 Summary

Training is the most important element of a comprehensive VE program. Training should include both formal and informal training and should be provided for all personnel from top management to operational management to operating personnel to value engineers. The type or method of training and the personnel who receive the training will depend upon the size and scope of the organization.

CHAPTER 9

RELATIONSHIP TO OTHER ACTIVITIES/PROGRAMS

9.1 Introduction

VE brings together the appropriate skills necessary to capture a specific target of opportunity. It uses these skills in a coordinated and disciplined effort to achieve all essential functions at minimum cost. Thus, VE is a means to utilize and manage defense resources more effectively. It complements rather than competes with other activities. The relationship of VE to some of these DOD programs and disciplines is discussed below.

9.2 Cost Reduction Programs

The single trait which sets VE apart from other cost reduction endeavors is its functional, analytical approach. The traditional cost reduction programs normally strive to reduce costs of an item or product without addressing its basic function. In VE, the function of the item is identified, costs are determined for any alternative which can accomplish the same function, and the alternative having the lowest actual cost is selected for its superior value assuming it can meet all system or program requirements. VE complements, rather than competes with, the following cost reduction programs.

(1) DOD Cost-Effectiveness Studies. These are studies employed during early program planning stages to compare overall program effectiveness and associated costs of alternative concepts, using "what if" type exercises.

There are significant opportunities to improve the interaction between cost-effectiveness studies and value methodology. In the early program stages, the use of VE will cause those designs resulting from the study and analysis to be much more cost-effective, contributing to an overall design having a total cost consistent with the "worth" of the system or product functions.

(2) Design-to-Cost (DTC) Goals. The DTC goals are provided to a contractor during the development phase. Generally, the VE clause is not used during the development phase. However, VE methodology can be utilized to achieve DTC goals. In those rare situations when the VE clause and DTC incentives are used in the same contract, care must be taken to ensure that the applicability of each is clearly defined. The DTC and VE incentives cannot duplicate each other. The DTC applies to what the contractor may change without Government approval, and VE applies to that part of the contract which the contractor may change with Government approval.

(3) Life Cycle Cost (LCC) and Logistic Support Analysis (LSA). Life cycle costing emphasizes cost visibility whereas VE methodology seeks cost optimization while maintaining essential functions/requirements. The LSA is utilized to establish maintenance plans and to ensure that the design process incorporates logistic requirements and cost considerations. The LSA is required to determine LCC. Value Engineering methodology can be utilized in the conduct of LSA to meet system requirements at the lowest possible cost.

9.3 Army Ideas for Excellence Program (AIEP)

The AIEP, as delineated in Army Regulation (AR) 5-17, provides a standard method for both military and civilian Government employees to submit ideas for improvement. This program is intended to encourage

employees to improve present policy, practices, and regulatory constraints which do not facilitate good management and are not needed in time of war. The AIEP is intended to improve morale by providing an opportunity for employees to take part voluntarily in the improvement of management within the Government. AIEP recommendations are generally not as complex as VEPs and unlike VEPs, do not result from formal VE studies or from the formal application of VE methodology. This program, formerly known as the suggestion program, provides guidance for the payment of AIEP awards and this guidance may be used in the calculation of award payments for VEP origination and development.

9.4 Standardization

The DOD standardization program is intended to achieve design to cost, life cycle cost savings, and cost avoidances. These objectives are achieved by applying techniques to: assist Government managers and contractors in the selection of parts commensurate with requirements, minimize the proliferation of parts in new designs, enhance interchangeability, reliability, and maintainability of equipment and supplies, and conserve resources. VE shares these objectives but operates in a broader context. While VE studies often result in replacing costly specialized items with standard equivalent items, multiple approaches are analyzed in obtaining best value.

9.5 Total Quality Management (TQM)

Total quality management is an organizational strategy to make quality a driving consideration in all phases of a product's life cycle. The objective of TQM is to change the long standing industrial culture of acceptable quality to one with the constancy of purpose for continuous improvement of quality and productivity on an enterprise wide basis. TQM can be defined as a total organizational approach to continuous improvement of quality and productivity directed toward increased customer and user satisfaction. TQM ideology embraces the integration of concurrent engineering, design of experiments, and quality function deployment. TQM can be considered a corporate mind set for continuous improvement whereas VE is a team oriented, structured application of a specific methodology. VE can also be viewed as an effective TQM tool.

9.6 Concurrent Engineering (CE)

Concurrent engineering is a systematic approach to the integrated, concurrent design of products and their related processes, including manufacturing and support. CE is the simultaneous and integrated engineering of all design, manufacturing, and support aspects of a product from concept to distribution. It is a teaming concept which brings together the disciplines which generally would be involved sequentially over the life cycle of a product. CE uses steps in its process which closely parallel the VE job plan. Additionally, CE operates under the same multi-disciplined team concept that makes VE so effective. CE differs from VE in that VE is based on function analysis and CE is based on the integration of the various disciplines involved over the life cycle of a product.

9.7 Operation and Support Cost Reduction (OSCR)

The Army spends over half of its budget, either directly or indirectly, on the Operation and Support (O&S) of its mission equipment. O&S cost drivers include the costs of items ranging from spare and repair parts for equipment to the facilities and people involved in training operators and mechanics. The OSCR effort is an umbrella program which implements several methodologies to redesign and re-engineer spares which cause high O&S costs. OSCR assures that the O&S implications of any new program or major program modification are well understood and that trade-off analyses are presented to decision makers at major

program milestones. It also establishes criteria to ensure that the O&S cost implications of advanced technology are fully understood before the new technology is incorporated into systems. Another OSCR initiative assures that product improvements aimed at O&S cost reduction are second only to critical safety issues in funding priority. OSCR is concerned with O&S cost reduction while VE targets value improvement in all phases of the life cycle of materiel.

9.8 Technology Insertion (TI)

Technology Insertion on spare and repair items is used primarily to reduce O&S costs at the component or subassembly level. Costs are reduced by utilizing state of practice technology to replace older, less reliable or more costly technology or to insert technology which is more easily maintained, e.g., replacing a discrete component card requiring complex alignment procedures with a single integrated circuit on a card which is self-aligning. The highest near-term payoffs, among the OSCR initiatives, can result from TI in a fielded system's components and spares. VE often applies TI when it identifies a superior or less costly technology as the optimum choice after conducting function analysis.

9.9 Summary

VE reinforces the efforts of various product and process improvement initiatives. It utilizes the expertise of interdisciplinary teams to achieve best value and other benefits through the application of a structured methodology.

APPENDIX A

ACRONYMS

ACO	Administrative Contracting Officer
AFAR	Army Federal Acquisition Regulation
AFIT	Air Force Institute of Technology
AMC	US Army Materiel Command
AIEP	Army Ideas for Excellence Program
AMCEN	HQ AMC Deputy Chief of Staff for Engineering, Housing, Environment and Installation Logistics
AMCRDA	HQ AMC Deputy Chief of Staff for Research, Development, and Acquisition
AMEC	US Army Engineering College
AR	Army Regulation
ASPR	Armed Services Procurement Regulation
CAVE	Contractual Aspects of VE
CCB	Configuration Control Board
CE	Concurrent Engineering
CM	Configuration Manager
DA	Department of the Army
DCMR	Defense Contract Management Region
DDN	Defense Data Network
DFAR	Defense Federal Acquisition Regulation
DID	Data Item Description
DoD	Department of Defense
DSN	Defense Switching Network
DTC	Design-to-Cost
ECP	Engineering Change Proposal
EIA	Electronic Industry Association
ESA	Engineering Support Activity
FAR	Federal Acquisition Regulation
FAST	Function Analysis System Technique
FCG	Functional Coordinating Group
FYDP	Future Year Defense Plan
GFP	Government Furnished Property
GPO	Government Procurement Office
HCA	Head of Contracting Activity
IEA	Industrial Engineering Activity
LCC	Life Cycle Cost
LOGSA	Logistics Support Activity
LSA	Logistic Support Analysis
MSC	Major Subordinate Command
O&S	Operation and Support Costs
OSCR	Operation and Support Cost Reduction
PAVE	Principles and Applications of VE
PCO	Principal Contracting Officer
PEO	Program Executive Officer
PM	Program/Product Manager
PMO	Program/Project Management Office

POC	Point of Contact
PRON	Procurement Request Order Number
R&D	Research and Development
ROI	Return on Investment
TDCC	Technical Data Control Center
TI	Technology Insertion
TOA	Total Obligational Authority
TQM	Total Quality Management
UVECP	Unsolicited Value Engineering Change Proposal
VE	Value Engineering
VECP	VE Change Proposal
VEIC	VE Incentive Clause
VEMP	VE Master Plan
VEMS	VE Management System
VEO	VE Office
VEP	VE Proposal
VEPM	VE Program Manager
VEPRC	VE Program Requirement Clause
VESAV	VE Staff Assistance Visit
VMG	Value Management Group

APPENDIX B

VALUE ENGINEERING STAFF ASSISTANCE VISITS

1. General

The following guidelines are provided for VESAVs conducted by the IEA at the MSCs. The primary purposes of the VESAVs are to substantiate the accuracy of reported VE savings, to assess overall VE program management, to evaluate compliance with the AMC VE Program guidance and to identify potential improvement to the AMC VE Program. The VESAVs are normally scheduled on a yearly basis to each VE reporting MSC.

2. Procedures

(a) Scheduling of the VESAV:

(1) The dates for the VESAV and planned itinerary will be informally coordinated with the VEPM of the respective MSC by the IEA VEPM.

(2) The tentative schedule will be confirmed with a memorandum from IEA to the MSC Commander. The memorandum will also provide detailed information concerning the VESAV. This memorandum will be provided to the MSC approximately one month prior to the scheduled VESAV. Additional data required by the VESAV Team are shown in Figure B-1.

(b) VESAV format is outlined below:

(1) An informational briefing at the MSC Command Group level is presented by the IEA VEPM.

(2) An entrance briefing is presented to the VESAV team by the MSC VEPM. The format is shown in Figure B-2.

(3) The VESAV team conducts a detailed review of the MSC VEP and VECP files.

(4) The VESAV team conducts interviews within the MSC VE organization, with procurement personnel, with MSC supported PEO VE Point of Contacts (POCs) and within other VE related areas.

(5) An exit briefing is presented to the designated MSC representatives by the IEA VEPM.

(6) MSCs with subordinate activities arrange access to representative activities and/or their VE data and records as part of the VESAV.

(c) VESAV Areas of Coverage:

(1) Personnel.

(2) The VE organization.

(3) Funding.

- (4) The VE Master Plan.
 - (5) The in-house VE Program. See General VEP file Checklist Figure B-3.
 - (6) The contractor VE Program. See General VECF File Checklist Figure B-4.
 - (7) The VE program management.
 - (8) Findings of non-compliance in previous VESAVs.
 - (9) Known areas of controversy or difficulty.
- (d) VESAV follow-up will be provided as appropriate to the situation.

Data required to be made available to satisfy areas of interest of the Review Team are outlined below:

1. Two copies of prior MSC VE reviews, inspections, audits, etc. (Do not include copies provided at previous VE Staff Visits.)
2. Two copies of the FY ____ MSC VE Master Plan, to include progress against goals documentation.
3. Official record files in support of VEPs and VECs used for VEARS input. As a minimum, these files should contain documentation sufficient to justify VEARS input data including funds identification. More specifically, VEP files should contain verification data (stating that VE savings were available for reprogramming) and study dates per Interim Value Engineering Policy. VEC files should contain copies of all direct and indirect contract modifications.
4. Two copies of all briefing charts used during the VEMP Entrance Briefing should be provided. In addition, provide two copies of the MSC's unofficial organizational structure (staff directory chart) showing, as a minimum, the directorate or division in which the VE office is located.

Figure B-1. Data Required from MSC for VE Staff Review Team

I. ORGANIZATION:

A. Management Structure:

1. VE Office in relation to command structure.
2. MSC VE organization-identify all VE coordinators, procurement VE coordinators, and other points of contact.

B. Personnel Status:

1. Authorized.
2. On hand.
3. Vacancies.
4. Assignments.
5. Plans, if any, to change current VE staff.
6. VE training (PAVE, CAVE, Instructor's, FAST, etc.)
7. VE awards.

II. FUNDING

A. Procedures for developing VE-related budget requests (pay of people, training, workshops, and for funds allocation, execution and tracking in the VE office.

B. Source and status of funds to conduct VE studies.

III. MANAGEMENT:

A. Procedure for implementing AMC VE guidance throughout MSC.

B. VE program progress reviews; the level to which reviews receive attention.

C. Actions taken to implement recommendations made in prior year(s) VE Staff Visit Command Report(s).

D. MSC internal incentives to promote VE.

E. MSC procedures to transfer successful VE initiatives among similar projects and systems not included in this study or contract.

F. Program to reward originators of VE action.

G. If it could be changed, identify the one thing that would significantly improve the MSC VE Program.

H. Future plans.

Figure B-2. Entrance Briefing Format for Value Engineering Staff Visit to MSC

VEP # _____ Control # (If used) _____

Title _____ System _____

TAB 1 IDENTIFICATION OF VE EFFORT
(Dated Informal Memorandum)

TAB 2 VE STUDY

Started _____ Completed _____

Function Analysis _____

VE PROPOSAL

Submitted _____

Approved/Disapproved _____

Implemented _____

TAB 3 FINANCIAL DATA

Savings Dollars:

Current Year _____

Budget Year _____

Future Budget Year _____

Development/Implementation Cost _____

TAB 4 VERIFICATION OF SAVINGS

Date of Informal Memorandum _____

Hard Dollars _____

Appropriations

Type Funds _____

Where Saved _____

Where Reprogrammed _____

Figure B-3. General VEP File Checklist

VECP # _____ Control # (If used) _____

Title _____ System _____

TAB 1 VECP Proposal

TAB 2 Acknowledgment of VECP

TAB 3 Approval/Disapproval of VECP

TAB 4 Contract Mod # _____

Contract # _____

Date of Mod _____

Dev/Imp Cost _____

Total Dollars Saved _____

Government % of Savings _____

Net Government Savings _____

TAB 5 Contract Mod # _____

Contract # _____

Date of Mod _____

Dev/Imp Cost _____

Total Dollars Saved _____

Government % of Savings _____

Net Government Savings _____

Figure B-4. General VECP File Checklist

APPENDIX C**SAMPLE CHECKLIST FOR VECP TRANSMITTAL**

FROM:

CONTRACTOR _____ DATE _____

LOCATION _____ VECP NO. _____

TO: _____ PROPOSED IMPLEMENTATION DATE _____

CONTRACT NO. _____ END ITEM _____

-
END ITEM CURRENTLY IN PRODUCTION YES/NO IF YES, GIVE SCHEDULED PRODUCTION QUANTITIES AND PRODUCTION COMPLETION DATES: (REQUIRED FOR SAVINGS CALCULATION)

<u>YEAR</u>	<u>QUANTITIES (EA)</u>	<u>FROM (MONTH)</u>	<u>TO (MONTH)</u>
FY _____	_____	_____	_____
FY _____	_____	_____	_____
FY _____	_____	_____	_____
FY _____	_____	_____	_____

ATTACHED SUPPORT DATA:

(YES/NO) ESTIMATE (COST/SAVINGS) INSTANT \$ _____ FUTURE \$ _____ COLLATERAL \$ _____

(YES/NO/NOT APPLICABLE) TEST REPORTS _____ DATE _____

(YES/NO/NOT APPLICABLE) DRAWINGS _____ DATE _____

(YES/NO/NOT APPLICABLE) SPECS _____ DATE _____

- (YES/NO/NOT APPLICABLE) DD FORM 1692 _____ DATE _____

(YES/NO/NOT APPLICABLE) DD Form 1693 _____ DATE _____

(YES/NO/NOT APPLICABLE) OTHER _____ DATE _____

REMARKS _____

TRANSMITTED BY (NAME/RANK/TITLE) _____

OFFICE SYMBOL _____ TELEPHONE _____

CF: _____ (w/wo encl) GOV'T CONTROL NO. _____

_____ (w/wo encl)

_____ (w/wo encl)

AMCCOM Form 367-R, 1 Mar 85(TEMP)

APPENDIX D

**FEDERAL ACQUISITION REGULATION
VALUE ENGINEERING POLICIES, PROCEDURES, AND
CONTRACT CLAUSES**

March 7, 1990

PART 48
VALUE ENGINEERING

TABLE OF CONTENTS

- 48.000 Scope of part.
- 48.001 Definitions.

SUBPART 48.1 POLICIES AND PROCEDURES

- 48.101 General.
- 48.102 Policies.
- 48.103 Processing value engineering change proposals.
- 48.104 Sharing arrangements.
- 48.104-1 Sharing acquisition savings.
- 48.104-2 Sharing collateral savings.
- 48.104-3 Sharing alternative no-cost settlement method.
- 48.105 Relationship to other incentives.

SUBPART 48.2 CONTRACT CLAUSES

- 48.201 Clauses for supply or service contracts.
- 48.202 Clause for construction contracts.

PART 48**VALUE ENGINEERING****48.000 Scope of part.**

This part prescribes policies and procedures for using and administering value engineering techniques in con-tracts.

48.001 Definitions.

"Acquisition savings," as used in this part, means savings resulting from the application of a value engineering change proposal (VECP) to contracts awarded by the same contracting office or its successor for essentially the same unit. Acquisition savings include -

(a) Instant contract savings, which are the net cost reductions on the contract under which the VECP is submitted and accepted, and which are equal to the instant unit cost reduction multiplied by the number of instant contract units affected by the VECP, less the contractor's allowable development and implementation costs;

(b) Concurrent contract savings, which are net reductions in the prices of other contracts that are definitized and ongoing at the time the VECP is accepted; and

(c) Future contract savings, which are the product of the future unit cost reduction multiplied by the number of future contract units scheduled for delivery during the sharing period (but see 48.102(g)). If the instant contract is a multiyear contract, future contract savings include savings on quantities funded after VECP acceptance.

"Collateral costs," as used in this part, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this part, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contracting office," as used in this part, includes any contracting office that the acquisition is transferred to, such as another branch of the agency or another agency's office

that is performing a joint acquisition action.

"Contractor's development and implementation costs," as used in this part, means those costs the contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Future unit cost reduction," as used in this part, means the instant unit cost reduction adjusted as the contracting officer considers necessary for projected learning or changes in quantity during the sharing period. It is calculated at the time the VECP is accepted and applies either (a) throughout the sharing period, unless the contracting officer decides that recalculation is necessary because conditions are significantly different from those previously anticipated, or (b) to the calculation of a lump-sum payment, which cannot later be revised.

"Government costs," as used in this part, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistics support. The term does not include the normal administrative costs of processing the VECP or any increase in instant contract cost or price resulting from negative instant contract savings.

"Instant contract," as used in this part, means the con-tract under the VECP is submitted.

It does not include increases in quantities after acceptance of the VECP that are due to contract modifications, exercise of options, or additional orders. If the contract is a multiyear contract, the term does not include quantities funded after VECP acceptance. In a fixed-price contract with prospective price redetermination, the term refers to the period for which firm prices have been established.

"Instant unit cost reduction" means the amount of the decrease in unit cost of performance (without deducting any contractor's development or implementation costs) resulting from using the VECP on the instant contract. In service contracts, the instant unit cost reduction is normally equal to the number of hours per line-item task saved by using the VECP on the instant contract, multiplied by the appropriate contract

labor rate.

"Negative instant contract savings" means the increase in the instant contract cost or price when the acceptance of a VECP results in an excess of the contractor's allowable development and implementation costs over the product of the instant unit cost reduction multiplied by the number of instant contract units affected.

"Net acquisition savings" means total acquisition savings, including instant, concurrent, and future contract savings, less Government costs.

"Sharing base," as used in this part, means the number of affected end items on contracts of the contracting office accepting the VECP.

"Sharing period," as used in this part, means the period beginning with acceptance of the first unit incorporating the VECP and ending at the later of (a) 3 years after the first unit affected by the VECP is accepted or, (b) the last scheduled delivery date of an item affected by the VECP under the instant contract delivery schedule in effect at the time the VECP is accepted (but see 48.102(g)).

"Unit," as used in this part, means the item or task to which the contracting officer and the contractor agree the VECP applies.

"Value engineering," as used in this part, means an organized effort to analyze the functions of systems, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life cycle cost consistent with required performance, reliability, quality, and safety.

"Value engineering change proposal (VECP)" means a proposal that -

(a) Requires a change to the instant contract to implement; and

(b) Results in reducing the overall projected cost to the agency without impairing essential functions or characteristics; *provided*, that it does not involve a change-

(1) In deliverable end item quantities only;

(2) In research and development (R&D) items or R&D test quantities that are due solely to results of previous testing under the

instant contract; or

(3) To the contract type only.

"Value engineering proposal," as used in this part, means, in connection with an A-E contract, a change proposal developed by employees of the Federal Government or contractor value engineering personnel under contract to an agency to provide value engineering services for the contract or program.

SUBPART 48.1-POLICIES AND PROCEDURES

48.101 General.

(a) Value engineering is the formal technique by which contractors may (1) voluntarily suggest methods for performing more economically and share in any resulting savings or (2) be required to establish a program to identify and submit to the Government methods for performing more economically. Value engineering attempts to eliminate, anything that increases acquisition, operation, or support costs.

(b) There are two value engineering approaches:

(1) The first is an incentive approach in which contractor participation is voluntary and the contractor uses its own resources to develop and submit any value engineering change proposals (VECP's). The contract provides for sharing of savings and for payment of the contractor's allowable development and implementation costs only if a VECP is accepted. This voluntary approach should not in itself increase costs to the Government.

(2) The second approach is a mandatory program in which the Government requires and pays for a specific value engineering program effort. The contractor must perform value engineering of the scope and level of effort required by the Government's program plan and included as a separately priced item of work in the contract Schedule. No value engineering sharing is permitted in architect engineer contracts. All other contracts with a program clause share in savings on accepted VECP's, but at a lower percentage rate than under the voluntary approach. The objective of this value engineering program requirement is to ensure that

the contractor's value engineering effort is applied to areas of the contract that offer opportunities for considerable savings consistent with the functional requirements of the end item of the contract.

48.102 Policies.

(a) Agencies shall provide contractors a substantial financial incentive to develop and submit VECP's. Contracting activities will include value engineering provisions in appropriate supply, service, architect-engineer and construction contracts as prescribed by 48.201 and 48.202 except where exemptions are granted on a case-by-case basis, or for specific classes of contracts, by the agency head.

(b) Agencies shall (1) establish guidelines for processing VECP's, (2) process VECP's objectively and expeditiously, and (3) provide contractors a fair share of the savings on accepted VECP's.

(c) Agencies shall consider requiring incorporation of value engineering clauses in appropriate subcontracts.

(d) (1) Agencies other than the Department of Defense shall use the value engineering program requirement clause (52.248-1, Alternates I or II) in initial production contracts for major system programs (see definition of major system in 34.001) and for contracts for major systems research and development except where the contracting officer determines and documents the file to reflect that such use is not appropriate.

(2) In Department of Defense contracts, the VE program requirement clause (52.248-1, Alternates I or II), shall be placed in initial production solicitations and contracts (first and second production buys) for major system acquisition programs as defined in DoD Directive 5000.1, except as specified in subdivisions (d)(2)(i) and (ii) of this section. A program requirement clause may be included in initial production contracts for less than major systems acquisition programs if there is a potential for savings. The contracting officer is not required to include a program requirement clause in initial production contracts-

(i) Where, in the judgment of the

contracting officer, the prime contractor has demonstrated an effective VE program during either earlier program phases, or during other recent comparable production contracts.

(ii) Which are awarded on the basis of competition.

(e) Value engineering incentive payments do not constitute profit or fee within the limitations imposed by 10 U.S.C. 2306(d) and 41 U.S.C. 254(b) (see 15.903(d)).

(f) Generally, profit or fee on the instant contract should not be adjusted downward as a result of acceptance of a VECP. Profit or fee shall be excluded when calculating instant or future contract savings.

(g) In the case of contracts for items requiring an extended period of production (e.g., ship construction, major system acquisition), agencies may prescribe sharing of future contract savings on all future contract units to be delivered under contracts awarded for essentially the same item during the sharing period, even if the scheduled delivery date is outside the sharing period. For engineering-development and low-rate-initial-production contracts, the future sharing shall be on scheduled deliveries equal in number to the quantity required over the highest 36 consecutive months of planned production, based on planning or production documentation at the time the VECP is accepted.

(h) In the case of contracts for architect-engineer services, a contract shall include a separately priced line item for monetary value engineering of the scope and level of effort ensure that value engineering effort is applied to assigned areas of the contract that offer opportunities for significant savings to the Government. There shall be no snaring of value engineering savings in contracts for architect-engineer services.

(i) Agencies shall establish procedures for funding and payment of the contractor's share of collateral savings and future contract savings.

48.103 Processing value engineering change proposals.

(a) Instructions to the contractor for preparing a VECP and submitting it to the Government are included in paragraphs (c) and

(d) of the value engineering clauses prescribed in Subpart 48.2. Upon receiving a VECP, the contracting officer or other designated official shall promptly process and objectively evaluate the VECP in accordance with agency procedures and shall document the contract file with the rationale for accepting or rejecting the VECP.

(b) The contracting officer is responsible for accepting or rejecting the VECP within 45 days from its receipt by the Government. If the Government will need more time to evaluate the VECP, the contracting officer shall notify the contractor promptly in writing, giving the reasons and the anticipated decision date. The contractor may withdraw, in whole or in part, any VECP not accepted by the Government within the period specified in the VECP. Any VECP may be approved, in whole or in part, by a contract modification incorporating the VECP. Until the effective date of the contract modification, the contractor shall perform in accordance with the existing contract. If the Government accepts the VECP, but properly rejects units subsequently delivered or does not receive units on which a savings share was paid, the contractor shall reimburse the Government for the proportionate share of these payments. If the VECP is not accepted, the contracting officer shall provide the contractor with prompt written notification, explaining the reasons for rejection.

(c) The following Government decisions are not subject to the Disputes clause or otherwise subject to litigation under the Contract Disputes Act of 1978 (41 U.S.C. 601-613);

(1) The decision to accept or reject a VECP.

(2) The determination of collateral costs or collateral savings.

(3) The decision as to which of the sharing rates applies when Alternate II of the clause at 52.248-1, Value Engineering, is used.

48.104 Sharing arrangements.

48.104-1 Sharing acquisition savings.

(a) *Supply or service contracts.*

(1) The sharing base for acquisition savings is normally the number of affected end items on contracts of the contracting office ac-

cepting the VECP. The sharing rates (Government/contractor) for net acquisition savings for supplies and services are based on the type of contract, the value engineering clause or alternate used, and the type of savings, as follows:

GOVERNMENT/CONTRACTOR SHARES OF NET ACQUISITION SAVINGS (figures in percent)

Contract Type	Sharing Arrangement			
	Incentive (voluntary)		Program requirement (mandatory)	
	Instant contract rate	Concurrent and future contract rate	Instant contract rate	Concurrent and future contract rate
Fixed-price (other than incentive)	50/50	50/50	75/25	75/25
Incentive (fixed-price or cost)	*	50/50	*	75/25
Cost-reimbursement (other than incentive)**	75/25	75/25	85/15	85/15

*Same sharing arrangement as the contract's profit or fee adjustment formula.

**Includes cost-plus-award-fee contracts.

(2) Acquisition savings may be realized on the instant contract, concurrent contracts, and future contracts. The contractor is entitled to a percentage share (see subparagraph (1) above) of any net acquisition savings. Net acquisition savings result when the total of acquisition savings becomes greater than the total of Government costs and any negative instant contract savings. This may occur on the instant contract or it may not occur until reductions have been negotiated on concurrent contracts or until

future contract savings are calculated, either through lump-sum payment or as each future contract is awarded.

(i) When the instant contract is not an incentive contract, the contractor's share of new acquisition savings is calculated and paid each time such savings are realized. This may occur once, several times, or, in rare cases, not at all.

(ii) When the instant contract is an incentive contract, the contractor shares in instant contract savings through the contract's incentive structure. In calculating acquisition savings under incentive contracts, the contracting officer shall add any negative instant contract savings to the target cost or to the target price and ceiling price and then offset these negative instant contract savings and any Government costs against concurrent and future contract savings.

(3) The contractor shares in the savings on all affected units scheduled for delivery during the sharing period (but see 48.102(g)). The contractor is responsible for maintaining, for 3 years after final payment on the contract under which the VECP was accepted, records adequate to identify the first delivered unit incorporating the applicable VECP.

(4) Contractor shares of savings are paid through the contract under which the VECP was accepted. On incentive contracts, the contractor's share of concurrent and future contract savings and of collateral savings shall be paid as a separate firm-fixed-price contract line item on the instant contract.

(5) Within 3 months after concurrent contracts have been modified to reflect price reductions attributable to use of the VECP, the contracting officer shall modify the instant contract to provide the contractor's share of savings.

(6) The contractor's share of future contract savings may be paid as subsequent contracts are awarded or in a lump-sum payment at the time the VECP is accepted. The lump-sum method may be used only if the contracting officer has established that this is the best way to proceed and the contractor agrees. The contracting officer ordinarily shall make calculations as future contracts are awarded and, within 3 months after award, modify the instant

contract to provide the contractor's share of the savings. For future contract savings calculated under the optional lump-sum method, the sharing base is an estimate of the number of items that the contracting officer will purchase for delivery during the sharing period. In deciding whether or not to use the more convenient lump-sum method for an individual VECP, the contracting officer shall consider-

(i) The accuracy with which the number of items to be delivered during the sharing period can be estimated and the probability of actual production of the projected quantity;

(ii) The availability of funds for a lump-sum payment; and

(iii) The administrative expense of amending the instant contract as future contracts are awarded.

(b) *Construction contracts.* Sharing on construction contracts applies only to savings on the instant contract and to collateral savings. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by (1) 45 percent for fixed-price contracts or (2) 75 percent for cost-reimbursement contracts. Value engineering sharing does not apply to incentive construction contracts.

(c) *Architect-engineering contracts.* There shall be no sharing of value engineering savings in contracts for architect-engineer services.

48.104-2 Sharing collateral savings.

(a) The Government shares collateral savings with the contractor, unless the head of the contracting activity has determined that the cost of calculating and tracking collateral savings will exceed the benefits to be derived (see 48.201(e)).

(b) The contractor's share of collateral savings is 20 percent of the estimated savings to be realized during an average year of use but shall not exceed (1) the contract's firm-fixed-price, target price, target cost, or estimated cost, at the time the VECP is accepted, or (2) \$100,000, whichever is greater. In determining collateral savings, the contracting officer shall consider any degradation of performance, service life, or

capability. (See 48.104-1 (a) (4) for payment of collateral savings through the instant contract.)

48.104-3 Sharing alternative-no-cost settlement method.

To minimize the administrative costs for both parties when there is a known continuing requirement for the unit, consideration should be given to the settlement of a VECP submitted against the VE Incentive clause of the contract at no cost to either party. Under this method of settlement, the contractor would keep all of the savings on the instant contract, and all savings on its concurrent contracts only. The Government would keep all savings resulting from concurrent contracts placed on other sources, savings from all future contracts, and all collateral savings. Use of this method must be by mutual agreement of both parties for individual VECP's.

48.105 Relationship to other incentives.

Contractors should be offered the fullest possible range of motivation, yet the benefits of an accepted VECP should not be rewarded both as value engineering shares and under performance, design-to-cost, or similar incentives of the contract. To that end, when performance, design-to-cost, or similar targets are set and incentivized, the targets of such incentives affected by the VECP are not to be adjusted because of the acceptance of the VECP. Only those benefits of an accepted VECP not rewardable under other incentives are rewarded under a value engineering clause.

SUBPART 48.2 - CONTRACT CLAUSES

48.201 Clauses for supply or service contracts.

(a) *General.* The contracting officer shall insert a value engineering clause in solicitations and contracts when the contract amount is expected to be \$100,000 or more, except as specified in subparagraphs (1) through (5) and in paragraph (f) below. A value engineering clause may be included in contracts of lesser value if the contracting officer sees a potential for significant savings. Unless the chief of the contracting office authorizes its inclusion, the contracting officer shall *not* include a value engineering clause in

solicitations and contracts -

- (1) For research and development other than full-scale development;
- (2) For engineering services from not-for-profit or nonprofit organizations;
- (3) For personal services (see Subpart 37.1);
- (4) Providing for product or component improvement, unless the value engineering incentive application is restricted to areas not covered by provisions for product or component improvement;
- (5) For commercial products (see Part 11) that do not involve packaging specifications or other special requirements or specifications; or
- (6) When the agency head has exempted the contract (or a class of contracts) from the requirements of this Part 48.

(b) *Value engineering incentive.* To provide a value engineering incentive, the contracting officer shall insert the clause at 52.248-1, Value Engineering, in solicitations and contracts except as provided in paragraph (a) above (but see subparagraph (e)(1) below).

(c) *Value engineering program requirement.* (1) If a mandatory value engineering effort is appropriate (i.e., if the contracting officer considers that substantial savings to the Government may result from a sustained value engineering effort of a specified level), the contracting officer shall use the clause with its Alternate I (but see subparagraph (e)(2) below).

(2) The value engineering program requirement may be specified by the Government in the solicitation or, in the case of negotiated contracting, proposed by the contractor as part of its offer and included as a subject for negotiation. The program requirement shall be shown as a separately priced line item in the contract Schedule.

(d) *Value engineering incentive and program requirement.* (1) If both a value engineering incentive and a mandatory program requirement are appropriate, the contracting officer shall use the clause with its Alternate II (but see subparagraph (e) (3) below).

(2) The contract shall restrict the

value engineering program requirement to well-defined areas of performance designated by line item in the contract Schedule. Alternate II applies a value engineering program to the specified areas and a value engineering incentive to the remaining areas of the contract.

(e) *Collateral savings computation not cost-effective.* If the head of the contracting activity determines for a contract or class of contracts that the cost of computing and tracking collateral savings will exceed the benefits to be derived, the contracting officer shall use the clause with its -

- (1) Alternate III if a value engineering incentive is involved;
- (2) Alternate III and Alternate I if a value engineering program requirement is involved; or
- (3) Alternate III and Alternate II if both an incentive and a program requirement are involved.

(f) *Architect-engineer contracts.* The contracting officer shall insert the clause at 52.248-2, Value Engineering Architect-Engineer, in solicitations and contracts whenever the Government requires and pays for a specific value engineering effort in architect-engineer contracts. The clause at 52.248-1, Value Engineering, shall not be used in solicitations and contracts for architect-engineer services.

48.202 Clause for construction contracts.

The contracting officer shall insert the clause at 52.248-3, Value Engineering Construction, in construction solicitations and contracts when the contract amount is estimated to be \$100,000 or more, unless an incentive contract is contemplated. The contracting officer may include the clause in contracts of lesser value if the contracting officer sees a potential for significant savings. The contracting officer shall not include the clause in incentive-type construction contracts. If the head of the contracting activity determines that the cost of computing and tracking collateral savings for a contract will exceed the benefits to be derived, the contracting officer shall use the clause with its Alternate I.

FAC 90-3 JANUARY 22, 1991

PART 52-SOLICITATION PROVISIONS AND CONTRACT CLAUSES 52.248-1

52.248-1 Value Engineering.

As prescribed in 48.201, insert the following clause in supply or service contracts to provide a value engineering incentive under the conditions specified in 48.201. In solicitations and contracts for items requiring an extended period for production (e.g., ship construction, major system acquisition), if agency procedures prescribe sharing of future contract savings on all units to be delivered under contracts awarded during the sharing period, the contracting officer shall modify subdivision (i)(3)(i) and the first sentence under subparagraph (3) of the definition of acquisition savings by substituting "under contracts awarded during the sharing period" for "during the sharing period." For engineering-development and low-rate-initial-production solicitations and contracts, the contracting officer shall modify subdivision (i)(3)(i) and the first sentence under subparagraph (3) of the definition of acquisition savings by substituting for "the number of future contract units scheduled for delivery during the sharing period," "a number equal to the quantity required over the highest 36 consecutive months of planned production, based on planning or production documentation at the time the VECP is accepted."

VALUE ENGINEERING (MAR 1989)

(a) *General.* The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any net acquisition savings realized from accepted VECP's, in accordance with the incentive sharing rates in paragraph (f) below.

(b) *Definitions.* "Acquisition savings," as used in this clause, means savings resulting from the application of a VECP to contracts awarded by the same contracting office or its successor for essentially the same unit. Acquisition savings include -

- (1) Instant contract savings, which are the net cost reductions on this, the instant contract, and which are equal to the instant unit

cost reduction multiplied by the number of instant contract units affected by the VECP, less the Contractor's allowable development and implementation costs;

(2) Concurrent contract savings, which are net reductions in the prices of other contracts that are definitized and ongoing at the time the VECP is accepted; and

(3) Future contract savings, which are the product of the future unit cost reduction multiplied by the number of future contract units scheduled for delivery during the sharing period. If this contract is a multiyear contract, future contract savings include savings on quantities funded after VECP acceptance.

"Collateral costs," as used in this clause, means agency cost of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contracting office" includes any contracting office that the acquisition is transferred to, such as another branch of the agency or another agency's office that is performing a joint acquisition action.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Future unit cost reduction," as used in this clause, means the instant unit cost reduction adjusted as the Contracting Officer considers necessary for projected learning or changes in quantity during the sharing period. It is calculated at the time the VECP is accepted and applies either (1) throughout the sharing period, unless the Contracting Officer decides that recalculation is necessary because conditions are significantly different from those previously anticipated or (2) to the calculation of a lump-

sum payment, which cannot later be revised.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistics support. The term does not include the normal administrative costs of processing the VECP or any increase in this contract's cost or price resulting from negative instant contract savings.

"Instant contract," as used in this clause, means this contract, under which the VECP is submitted. It does not include increases in quantities after acceptance of the VECP that are due to contract modifications, exercise of options, or additional orders. If this is a multiyear contract, the term does not include quantities funded after VECP acceptance. If this contract is a fixed-price contract with prospective price redetermination, the term refers to the period for which firm prices have been established.

"Instant unit cost reduction" means the amount of the decrease in unit cost of performance (without deducting any Contractor's development or implementation costs) resulting from using the VECP on this, the instant contract.

If this is a service contract, the instant unit cost reduction is normally equal to the number of hours per line-item task saved by using the VECP on this contract, multiplied by the appropriate contract labor rate.

"Negative instant contract savings" means the increase in the cost or price of this contract when the acceptance of a VECP results in an excess of the Contractor's allowable development and implementation costs over the product of the instant unit cost reduction multiplied by the number of instant contract units affected.

"Net acquisition savings" means total acquisition savings, including instant, concurrent, and future contract savings, less Government costs.

"Sharing base," as used in this clause, means the number of affected end items on contracts of the contracting office accepting the VECP.

"Sharing period," as used in this clause, means the period beginning with acceptance of

the first unit incorporating the VECP and ending at the later of (1) 3 years after the first unit affected by the VECP is accepted or (2) the last scheduled delivery date of an item affected by the VECP under this contract's delivery schedule in effect at the time the VECP is accepted.

"Unit," as used in this clause, means the item or task to which the Contracting Officer and the Contractor agree the VECP applies.

"Value engineering change proposal (VECP)" means a proposal that -

(1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the overall projected cost to the agency without impairing essential functions or characteristics; *provided*, that it does not involve a change -

(i) In deliverable end item quantities only;

(ii) In research and development (R&D) end items or R&D test quantities that is due solely to results of previous testing under this contract; or

(iii) To the contract type only.

(c) *VECP preparation.* As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (8) below. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and the proposed requirement, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, the effect of the change on the end item's performance, and any pertinent objective test data.

(2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) Identification of the unit to which the VECP applies.

(4) A separate, detailed cost estimate

for (i) the affected portions of the existing contract requirement and (ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under the Subcontracts paragraph of this clause, below.

(5) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(6) A prediction of any effects the proposed change would have on collateral costs to the agency.

(7) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(8) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) *Submission.* The Contractor shall submit VECP's to the Contracting Officer, unless this contract states otherwise. If this contract is administered by other than the contracting office, the Contractor shall submit a copy of the VECP simultaneously to the Contracting Officer and to the Administrative Contracting Officer.

(e) *Government action.*

(1) The Contracting Officer shall notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer shall notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it shall not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer shall notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written

notification before undertaking significant expenditures for VECP effort.

(3) Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause and made either before or within a reasonable time after contract performance is completed. Until such a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The Contracting Officer's decision to accept or reject all or part of any VECP and the decision as to which of the sharing rates applies shall be final and not subject to the Disputes clause or otherwise subject to litigation under the Contract Disputes Act of 1978 (41 U.S.C. 601-613).

(f) *Sharing rates.* If a VECP is accepted, the Contractor shall share in net acquisition savings according to the percentages shown in the table below. The percentage paid the Contractor depends upon (1) this contract's type (fixed-price, incentive, or cost-reimbursement), (2) the sharing arrangement specified in paragraph (a) above (incentive, program requirement, or a combination as delineated in the Schedule), and (3) the source of the savings (the instant contract, or concurrent and future contracts), as follows:

**CONTRACTOR'S SHARE OF NET
ACQUISITION
SAVINGS**
(figures in percent)

Contract Type	Sharing Arrangement			
	Incentive (voluntary)		Program requirement (mandatory)	
	Instant con- tract rate	Con- current and future con- tract rate	Instant con- tract rate	Con- current and future con- tract rate
Fixed-price (other than incentive)	50	50	25	25
Incentive (fixed-price or cost)	*	50	*	25
Cost-reimbursement (other than incentive)**	25	25	15	15

*Same sharing arrangement as the contract's profit or fee adjustment formula.

**Includes cost-plus-award-fee contracts.

(g) *Calculating net acquisition savings.*

(1) Acquisition savings are realized when (i) the cost or price is reduced on the instant contract, (ii) reductions are negotiated in concurrent contracts, (iii) future contracts are awarded, or (iv) agreement is reached on a lump-sum payment for future contract savings (see subparagraph (i) (4) below). Net acquisition savings are first realized, and the Contractor shall be paid a share, when Government costs and any negative instant contract savings have been fully offset against acquisition savings.

(2) Except in incentive contracts, Government costs and any price or cost increases

resulting from negative instant contract savings shall be offset against acquisition savings each time such savings are realized until they are fully offset. Then, the Contractor's share is calculated by multiplying net acquisition savings by the appropriate Contractor's percentage sharing rate (see paragraph (f) above). Additional Contractor shares of net acquisition savings shall be paid to the Contractor at the time realized.

(3) If this is an incentive contract, recovery of Government costs on the instant contract shall be deferred and offset against concurrent and future contract savings. The Contractor shall share through the contract incentive structure in saving son the instant contract items affected. Any negative instant contract savings shall be added to the target cost or to the target price and ceiling price, and the amount shall be offset against concurrent and future contract savings.

(4) If the Government does not receive and accept all items on which it paid the Contractor's share, the Contractor shall reimburse the Government for the proportionate share of these payments.

(h) *Contract adjustment.* The modification accepting the VECP (or a subsequent modification issued as soon as possible after any negotiations are completed) shall -

(1) Reduce the contract price or estimated cost by the amount of instant contract savings, unless this is an incentive contract;

(2) When the amount of instant contract savings is negative, increase the contract price, target price and ceiling price, target cost, or estimated cost by that amount;

(3) Specify the Contractor's dollar share per unit on future contracts, or provide the lump-sum payment;

(4) Specify the amount of any Government costs or negative instant contract savings to be offset in determining net acquisition savings realized from concurrent or future contract savings; and

(5) Provide the Contractor's share of any net acquisition savings under the instant contract in accordance with the following:

(i) Fixed-price contracts add to contract

price.

(ii) Cost-reimbursement contracts add to contract fee.

(i) *Concurrent and future contract savings.* (1) Payments of the Contractor's share of concurrent and future contract savings shall be made by a modification to the instant contract in accordance with subparagraph (h)(5) above. For incentive contracts, shares shall be added as a separate firm-fixed-price line item on the instant contract. The Contractor shall maintain records adequate to identify the first delivered unit for 3 years after final payment under this contract.

(2) The Contracting Officer shall calculate the Contractor's share of concurrent contract savings by (i) subtracting from the reduction in price negotiated on the concurrent contract any Government costs or negative instant contract savings not yet offset and (ii) multiplying the result by the Contractor's sharing rate.

(3) The Contracting Officer shall calculate the Contractor's share of future contract savings by (i) multiplying the future unit cost reduction by the number of future contract units scheduled for delivery during the sharing period, (ii) subtracting any Government costs or negative instant contract savings not yet offset, and (iii) multiplying the result by the Contractor's sharing rate.

(4) When the Government wishes and the Contractor agrees, the Contractor's share of future contract savings may be paid in a single lump sum rather than in a series of payments over time as future contracts are awarded. Under this alternate procedure, the future contract savings may be calculated when the VECP is accepted, on the basis on the Contracting Officer's forecast of the number of units that will be delivered during the sharing period. The Contractor's share shall be included in a modification to this contract (see subparagraph (h)(3) above) and shall not be subject to subsequent adjustment.

(5) Alternate no-cost settlement method. When, in accordance with subsection 48.104-3 of the Federal Acquisition Regulation, the Government and the Contractor mutually agree to use the no-cost settlement method, the following applies:

(i) The Contractor will keep all the

savings on the instant and on its concurrent contracts only.

(ii) The Government will keep all the savings resulting from concurrent contracts placed on other sources, savings from all future contracts, and all collateral savings.

(j) *Collateral savings.* If a VECP is accepted, the instant contract amount shall be increased, as specified in subparagraph (h)(5) above, by 20 percent of any projected collateral savings determined to be realized in a typical year of use after subtracting any Government costs not previously offset. However, the Contractor's share of collateral savings shall not exceed (1) the contract's firm-fixed-price, target price, target cost, or estimated cost, at the time the VECP is accepted, or (2) \$100,000, whichever is greater. The Contracting Officer shall be the sole determiner of the amount of collateral savings, and that amount shall not be subject to the Disputes clause or otherwise subject to litigation under 41 U.S.C. 601-613.

(k) *Relationship to other incentives.* Only those benefits of an accepted VECP not rewardable under performance, design-to-cost (production unit cost, operating and support costs, reliability and maintainability), or similar incentives shall be rewarded under this clause. However, the targets of such incentives affected by the VECP shall not be adjusted because of VECP acceptance. If this contract specifies targets but provides no incentive to surpass them, the value engineering sharing shall apply only to the amount of achievement better than target.

(1) *Subcontracts.* The Contractor shall include an appropriate value engineering clause in any subcontract of \$100,000 or more and may include one in subcontracts of lesser value. In calculating any adjustment in this contract's price for instant contract savings (or negative instant contract savings), the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs, and any value engineering incentive payments to a subcontractor, clearly resulting from a VECP accepted by the Government under this contract. The Contractor may choose any arrangement for subcontractor value engineering incentive

payments; *provided*, that the payments shall not reduce the Government's share of concurrent or future contract savings or collateral savings.

(m) *Data.* The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering clause of contract, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

(End of clause)

Alternate I (APR 1984). If the contracting officer selects a mandatory value engineering program requirement, substitute the following paragraph (a) for paragraph (a) of the basic clause:

(a) *General.* The Contractor shall (1) engage in a value engineering program, and submit value engineering progress reports, as specified in the Schedule and (2) submit to the Contracting Officer any resulting value engineering change proposals (VECP's). In addition to being paid as the Schedule specified for this mandatory program, the Contractor shall share in any net acquisition savings realized from accepted VECP's, in accordance with the program requirement sharing rates in paragraph (f) below.

(R 7-104.44(b) 1974 APR)

Alternate II (APR 1984). If the contracting officer selects *both* a value engineering incentive and mandatory value

engineering program requirement, substitute the following paragraph (a) for paragraph (a) of the basic clause:

(a) *General:* For those contract line items designated in the Schedule as subject to the value engineering program requirement, the Contractor shall (1) engage in a value engineering program, and submit value engineering progress reports, as specified in the Schedule and (2) submit to the Contracting Officer any resulting VECP's. In addition to being paid as the Schedule specifies for this mandatory program, the Contractor shall share in any net acquisition savings realized from VECP's accepted under the program, in accordance with the program requirement sharing rates in paragraph (f) below.

For remaining areas of the contract, the Contractor is encouraged to develop, prepare, and submit VECP's voluntarily; for VECP's accepted under these remaining areas, the incentive sharing rates apply.

(NM)

Alternate III (APR 1984). When the head of the contracting activity determines that the cost of calculating and tracking collateral savings will exceed the benefits to be derived in a contract calling for a value engineering incentive, delete paragraph (j) from the basic clause and redesignate the remaining paragraphs accordingly.

APPENDIX E

CONTRACT PRICING PROPOSAL COVER SHEET

APPENDIX F

VALUE ENGINEERING AWARDS AND PUBLICITY

1. General

This appendix provides guidelines and general procedures for providing incentive awards (monetary and non-monetary) and publicity for the AMC VE Program. It encompasses both in-house and contractor VE efforts. The primary purpose is to recognize and publicize significant individual/group/command/corporate achievements in VE.

2. Monetary Awards Procedures

(a) Each VE reporting element will develop and implement a VE monetary awards program IAW the requirements of AR 672-20 and local installation incentive awards programs.

(b) The award recognition should be in the form of a "Special Act or Service" cash award and should be commensurate with the actual savings achieved. An amount equal to approximately 1.5 percent of saving should be used as a general guideline and should be shared by individuals performing the VE study/analysis effort. Local incentive awards offices should be consulted, as required, to ensure the VE cash award amounts are in compliance with Army regulatory requirements.

(c) All VE reporting elements should plan and budget funds for a VE cash award program.

(d) Monetary awards can also be received for VEPs through the AIEP. Award calculations and submission into the AIEP program must be in accordance with AIEP procedures. See AR 5-17, The Army Ideas for Excellence Program.

(e) An individual or team cannot receive a monetary award through the Government from more than one source for the same VE action, i.e., an individual cannot receive a Special Act Award and an AIEP Award for the same VEP.

3. Honorary Awards Procedures

(a) An honorary VE award program will be administered by AMC for nominations to the DoD/DA program as well as AMC's own VE honorary award program. The programs will include individual, government organizational, and contractor awards.

(b) IEA will establish criteria consistent with AMC Value Engineering goals for determining which AMC organizations and individuals should be nominated for the DoD/DA Honorary Value Engineering Achievement Awards and the AMC Honorary Value Engineering Achievement Awards.

(c) The VE savings used as a basis for determining the MSC's dollar savings achievement are those savings forwarded to DoD for the fiscal year immediately preceding the nominee submission date.

(d) The DoD/DA Honorary Value Engineering Awards are normally given annually by the DoD. Nominations for these awards are provided by the DA and the other components of DoD. AMC is allowed to furnish one candidate for each of the seven award categories, from those organizations in which the VE program is monitored by AMC.

(1) Award categories are as follows:

(a) Field Command: This is the command that has accumulated the highest dollar savings for the fiscal year immediately preceding the nominee submission date, the most significantly improved VE program or other factors highly deserving recognition.

(b) Installation: This is the installation that has accumulated the highest dollar savings for the fiscal year immediately preceding the nominee submission date, the most significantly improved VE program or other factors highly deserving of recognition.

(c) Program/Project Manager Office (PMO): This is the PMO (reporting VE program achievements thru AMC) that has accumulated the highest dollar savings for the fiscal year immediately preceding the nominee submission date, the most significantly improved VE program or other factors highly deserving of recognition.

(d) VE Professional: An individual who devotes full time to VE and has accomplished actions which merit recognition. The VE action must have significantly impacted the VE program for the fiscal year immediately preceding the nominee submission date.

(e) VE Individual/Team: An individual/team who devotes a limited amount of time to VE, and has initiated or accomplished VE action which merits recognition. The VE action must have significantly impacted the VE program for the fiscal year immediately preceding the nominee submission date.

(f) VE Contractor: The contractor that has accumulated the highest dollar savings to the government for the fiscal year immediately preceding the nominee submission date, the most significantly improved VE program, or other factors highly deserving of recognition.

(g) Procurement/Contract Administration Personnel: An individual working in Procurement who provides support to the VE program which merits recognition for dollar savings to the Government for the fiscal year immediately preceding the nominee submission date.

(2) DoD/DA award candidate nomination procedures are outlined below:

AWARD CATEGORY	NOMINATOR	INITIAL CANDIDATE SELECTION	AMCRD COORDINATION	APPROVAL FOR NOMINATION TO DA
FIELD COMMAND	IEA	IEA	AMCRD	AMC CS
INSTALLATION	MSC	IEA	AMCRD	AMC CS
PMO	MSC	IEA	AMCRD	AMC CS
VE PROFESSIONAL	MSC & IEA	IEA	AMCRD	AMC CS
VE INDIVIDUAL	MSC	IEA	AMCRD	AMC CS
CONTRACTOR	MSC	IEA	AMCRD/AMCCC	AMC CS
PROCUREMENT/CONTRACT	MSC	IEA	AMCRD	AMC CS

(a) IEA will solicit nominations annually from each of the MSCs immediately following the close of the fiscal year. The MSCs as a focal point for PEO VE projects will provide award nominees for the PEOs. Each nominee must meet the criteria for the category for which the nomination is intended. The nomination must be in writing and must contain the following information:

- (1) Category for which the nomination is intended.
- (2) Full name of the nominee, organizational address and telephone number.
- (3) A narrative description of specific facts pertaining to why the nominee is deserving of recognition (limit 1 page).
- (4) Field Commands, Installation, PMO, and contractor awards are organizational and, therefore, shall contain the name of the head of the organization being nominated. Example - Field Command and Installation use the Commander, PMO uses the PMs name and Contractor uses CEO, President or Chairman. The VE Professional, VE Individual/Team, and the Procurement/Contract Administration Personnel awards are in recognition of individual achievements, therefore, the individual's name shall be given.
- (5) A draft letter of commendation for the nominee identifying actions for which the award is being made (limit 30 single lines).
- (6) Each contractor award nomination must be staffed through the local Office of Legal Counsel prior to forwarding to IEA.

(b) IEA will select the initial candidates based on the nominations provided by the MSCs, the VEMS data, and the results of the VE staff visits. IEA will also prepare the DoD/DA award package containing the draft letters of commendation for signature by Secretary of Defense, a narrative description of facts explaining why the nominee is deserving of recognition, and the necessary letters of transmittal.

(c) The DoD/DA award candidate package will be staffed through HQ AMC .

(1) DoD award presentations for the seven categories are as follows:

(a) Field Command and Installation awards will be presented by the Deputy Secretary of Defense or a designated flag rank representative. The winner of this award will receive a wall plaque, a letter of commendation and a pennant in an appropriate ceremony. The pennant may be flown on command's masthead for one year and then retired.

(b) Program/Project Manager, VE Individual, VE Professional and Procurement/Contract Administration Personnel award will be presented at the Pentagon in the presence of the appropriate service executives of the component. Each winner will receive a wall plaque, and letter of commendation.

(c) Contractor award will be presented by the Deputy Secretary of Defense or a designated flag rank representative to an executive representing the company at an appropriate ceremony. The winner will receive a wall plaque, a letter of commendation and a VE pennant. The VE pennant may be flown on a company masthead for one year and then retired.

(e) The AMC Honorary Value Engineering Awards are given annually by AMC. Award recipients will be selected from those organizations in which the VE program is monitored by AMC. These awards consist of a plaque and a memorandum. AMC may award more than one plaque in each category. The award categories and procedures are as follows:

(1) The eight award categories and the selection criteria are outlined below:

(a) Field Command: These awards are for the command that merits recognition for significant contribution to the AMC dollar savings goal for the fiscal year immediately proceeding the nominee submission date, has the most substantially improved program, or other factors highly deserving of recognition.

(b) Installation: These awards are for the installation that merits recognition for significant contribution to the AMC VE dollar savings goal for the fiscal year immediately preceding the nominee submission date, has the most substantially improved program or other factors highly deserving recognition.

(c) Program Executive Office (PEO): These awards are for the PEO that merits recognition for significant contributions to the AMC VE dollar savings goal for the fiscal year immediately preceding the nominee submission date, has the most substantially improved program or other factors highly deserving of recognition.

(d) Program/Project Manager Office (PMO): These awards are for the PMO (reporting VE program achievements to AMC) that merits recognition for significant contribution to the AMC VE dollar savings goal for the fiscal year immediately preceding the nominee submission date, has the most substantially improved VE program or other factors highly deserving of recognition.

(e) VE Professional: Individual who devotes full time to VE and has accomplished VE actions which merits recognition. The VE action must have significantly impacted the VE program for the fiscal year immediately preceding the nominee submission date.

(f) VE Individual/Team: Individual/Team(s) who devote a limited amount of time to VE, and has initiated or accomplished VE action which merits recognition. The VE action must have significantly impacted the VE program for the fiscal year immediately preceding the nominee submission date.

(g) **Procurement Individual:** Individuals working in procurement who provide support to the VE program which merits recognition for significant contribution to the VE program for the fiscal year immediately preceding the nominee submission date.

(h) **Contractor:** The contractors who warrant recognition for dollar savings to the government for the fiscal year immediately preceding the nominee submission date, the most substantially improved VE program or other factors highly deserving of recognition. There are three savings categories: over \$500,000; \$100,000 to \$500,000; and small contractors with contracts too small to achieve \$100,000 savings, but the percentage of savings warrant recognition.

(2) AMC award candidate nomination procedures are outlined below:

AWARD CATEGORY	NOMINATOR	INITIAL CANDIDATE SELECTION	COORDINATION	APPROVAL FOR AMC AWARD
FIELD COMMAND	IEA	IEA	AMCRD	AMC CG
INSTALLATION	MSC	IEA	AMCRD	AMC CG
PEO	MSC	IEA	AMCRD	AMC CG
PMO	MSC	IEA	AMCRD	AMC CG
VE PROFESSIONAL	MSC & IEA	IEA	AMCRD	AMC CG
VE INDIVIDUAL/TEAM	MSC	IEA	AMCRD	AMC CG
PROCUREMENT	MSC	IEA	AMCRD	AMC CG
INDIVIDUAL				
CONTRACTOR	MSC	IEA	AMCRD/AMCCC	AMC CG

(a) IEA will solicit nominations annually from each of the MSCs immediately following the close of the fiscal year. Each nomination must meet the criteria for the category for which the nomination is intended and must be in writing containing the following information:

(1) Category for which the nomination is intended.

(2) Full name of the nominee, organizational address and telephone number.

(3) Installation, PEO, PMO and contractor award are organizational and, therefore, shall contain the name of the head of the organization receiving the nomination. Example - Installation use Commander, PEO use the head of the office, PMO use the PMs name and Contractor use CEO, President, or Chairman. The VE Professional, Procurement Individual and VE Individual/Team awards are in recognition of individual achievement, therefore, the individual's name shall be given.

(4) A draft letter of commendation for nominee identifying action for which the award is being made (limit 30 single line spaces).

(5) Each contractor award nomination must be staffed through the local Office of Legal Counsel prior to forwarding to IEA.

(b) IEA will select the award candidates from the nominations provided by MSCs, the

VEARS data, and the results of staff visits. IEA will prepare the awards package containing letters of commendation for signature by the Commanding General AMC, plaques and the necessary letters of transmittal.

(c) The AMC award candidates will be staffed through AMCRD, AMCCC and signed by AMCCG.

(d) AMC award presentation for the eight categories is as follows:

AWARD CATEGORY	PRESENTER
FIELD COMMAND	AMCCG
INSTALLATION	MSC
PEO	AMCCG
PMO	AMCCG/PEO
VE PROFESSIONAL	MSC
VE INDIVIDUAL	MSC
PROCUREMENT INDIVIDUAL	MSC
CONTRACTOR	MSC/PEO

(f) These VE award programs should not prevent AMC Subordinate Commands from issuing their own awards based on whatever criteria they believe suitable. If this is done, awards to contractors must be coordinated with HQ AMC to avoid conflicts.

4. Publicity

(a) IEA will publicize for AMC the VE program accomplishments, identify project candidates, gather and collate data for publicity, and will --

(1) Publish and distribute VE project accomplishments in an annual brochure describing the outstanding achievements, ingenuity and applicability of the VE projects. This brochure will have a short narration of the conditions "before" and "after" along with the dollar savings to the government.

(2) Exhibit VE accomplishments at appropriate functions. Select worthy VE material to be exhibited. Arrange for the preparation, display, and maintenance of the VE exhibit.

(3) Prepare, publish, and distribute handouts, posters and other publicity information deemed appropriate for assisting in the achievement of AMC VE goals.

(b) The MSC will serve as the focal point to assist in meeting AMC's VE objective for VE project information from its commodity area and will provide data and pictures to IEA or IEA's contractor for publicity of VE activities.

(c) The MSCs will publicize VE within their own organizations, as deemed appropriate.

(d) IEA will provide publicity support and assistance to the MSCs and PEOs/PMs, as resources permit.